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ABSTRACT

This collection of documents from Association of Research Libraries (ARL) member libraries in the United States and Canada contains examples of strategic planning, a method which deliberately attempts to concentrate resources in areas that could make a substantial difference in future performance and capabilities. Contents include: (1) a university plan from the University of Pittsburgh; (2) library environmental assessments from the Office of Management Studies, the University of North Carolina at Chapel Hill, Texas A&M University Library, and the University of Michigan; and (3) long-range planning documents from the University of California at Riverside, Massachusetts Institute of Technology, the University of Pittsburgh, the University of Pennsylvania, and the University of Western Ontario. A concise summary of a telephone survey of 30 ARL libraries indicates that most ARL strategic planning documents are descriptive of library strengths and weaknesses; contain considerable speculation about the future prospects of research libraries; identify specific priorities and define the costs of desired courses of action; and suggest an activist posture on the part of library leadership in shaping the views and actions of the university community. A 13-item bibliography and an ARL Systems and Procedures Exchange Center (SPEC) kit evaluation form are also included. (KM)

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Strategic Planning in ARL Libraries

Kit 108

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STRATEGIC PLANNING IN ARL LIBRARIES

Research libraries have conducted planning as a formal activity to chart future directions for some time. In the past 10 years, OMS/SPEC resources supporting this activity have included an ARL Management Supplement, a SPEC Flyer and Kit on Planning Systems, a Planning Resource Notebook and an Occasional Paper on Planning Aids for Directors. Traditional planning encompasses operational planning, project proposals, budget planning, long-range planning and manpower planning. Strategic planning, however, attempts to go beyond the more familiar planning efforts to redefine and focus on the basic nature of the institution.

Strategic planning procedures are similar to other planning activities: analyzing capabilities, assessing environmental pressures and opportunities, setting objectives, examining alternative courses of action, and implementing a preferred course. However, what is different about strategic planning is the deliberate attempt to concentrate resources in those areas which can make a substantial difference in future performance and capabilities. Thus strategic planning is more a frame of reference and a way of thinking than a set of procedures. As a result, strategic planning departs from familiar incremental resource allocation and operational problem-solving patterns that are a part of university life.

The expectation with strategic planning is that if a library can skillfully choose areas in which it has an advantage or a special opportunity and then concentrate its resources in those areas, it can achieve excellence far beyond what the size or resources of the university would apparently allow. The most important aspects of this approach are judgemental in character: (1) selecting the appropriate areas to emphasize, (2) determining the shrewdest course of action and (3) stimulating the changes required.

PLANNING DOCUMENTS. A SPEC telephone survey of 30 ARL members' planning efforts in early 1984 reveals a flurry of plans that possess strategic characteristics. Most documents are descriptive of library strengths and weaknesses. These balanced reviews are intended as forthright statements of reality, and do not gloss over difficulties or sound unduly pessimistic. They address questions of what the library does especially well, what the library does that no other department can do, and which user groups represent primary client groups. Second, these plans contain considerable speculation about the future prospects of research libraries. While these speculations tend to be more general than a formal scenario, they do attempt to anticipate trends in information technology especially as they affect the generation, distribution, and use of scholarly information. These speculations take a long term perspective and look at the broader context in which libraries perform including economic development, university prospects, and political constraints.

Third, the plans identify specific priorities and define the costs of desired courses of action. Priorities most frequently mentioned are: integrated library automation systems, strengthened public services, preservation activities and policies, library operating efficiencies, and the quality of library staff. While support of collections, added and improved space, and overall

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budget support are noted also, the thrust of these library plans is toward identifying a few key factors which will have the most impact on future success and can attract the financial support of administrative agents who may be jaded by continued requests for more books, more space, more staff and more operating monies.

Finally, the documents available to the Office suggest an activist posture on the part of library leadership in shaping the views and actions of the university community. These plans are polished, persuasive instruments for acquainting the various constituencies of the library with the extraordinary opportunities facing the university in the future. The communication and educational value of these reports cannot be overestimated. Unlike the more traditional annual reports which focus on operations, these plans are dealing with transforming the organization with new technology, redeployment of resources, and an innovative conceptualization of library role and contribution.

THE PROCESS OF STRATEGIC PLANNING. A limitation in a review of planning documents is the lack of access to the wider pool of the strategic thinking that occurs in many research libraries. While this thinking may not lead to formal plans, it is leading to decisions and actions regarding the fate of the research library. Choices to hold the line or to battle for incremental additions are being supplemented by new fundraising efforts, creation of new organizational agencies, introduction of new services, aggressive pursuit of inter-institutional cooperation, and an emphasis on understanding and controlling costs.

In addition, most of these reports do not comment on the process for completing the strategic analysis. Some of the documents are a product of OMS supported self-study projects in the areas of collection analysis, public services and preservation. These projects are initiated and managed by senior library management with broad staff involvement, with the products then implemented by line managers. Documents also underscore the central role of the chief executive officer in the initiation, construction, and presentation of the strategic plan. Many are extraordinary personal statements. And all reflect a systematic attempt to scan the environment, select appropriate areas to emphasize, and define methods for achieving desired goals. Specific components of these processes include historical profiles; assessments of functions and user needs; scenarios and forecasts which attempt to interpret future environments; development of planning assumptions and principles; identification of priorities, including required shifts in emphasis; and a scheme for implementation.

TRENDS. The prospects are encouraging for more strategic planning as universities struggle to cope with changing enrollments, competing pressures for use of limited resources, and emerging information technology. Research libraries are using aspects of strategic planning to argue for major new expenditures, shifts in programs, and effective use of available technology.

In the future, this strategic response will have to be more agile. Libraries will not have the luxury of spending months or years studying an issue. There will be a need to be more entrepreneural and aggressive in defining new capabilities. The processes for introducing change and developing commitment to new directions will need to be cost-efficient. And the speed of change in technology and the environment generally will likely increase and intensify.

SPEC Kit #108, Strategic Planning in ARL Libraries, contains one university plan, four library environmental assessments, five long-range planning documents, and a two-page listing of selected readings. SPEC Kits are available by subscription from the SPEC Center, Office of Management Studies, Association of Research Libraries, 1527 New Hampshire Ave., N.W., Washington, D.C. 20036. Individual kits may be ordered for $15.00 each, prepayment required. Orders outside the U.S. and Canada, add $5.00 for parcel post shipping and handling. (ARL members receive SPEC kits for $7.50.)

USES OF SPEC KITS

The Systems and Procedures Exchange Center (SPEC) is a clearinghouse operated by the Association of Research Libraries, Office of Management Studies that provides a central source of timely information and materials on the management and operations of large academic and research libraries. It facilitates the exchange of knowledge and documents through SPEC Kits, which are distributed ten times each year to ARL members and other interested libraries. The Kits include topically-arranged groupings of unedited primary source documents – selected for their value to administrators and decision-makers – that illustrate a wide range of alternative approaches to specific issues.

Kit documents come from general membership surveys and from selected libraries contacted directly by SPEC, and most Kits are produced within six months of surveys. The documents' value comes from their variety of ideas, methods, and solutions. They are not viewed as finished products, but rather as points of departure for a library's planning efforts and as stimulants to innovative approaches to problem-solving. As such, Kits do not present answers or prescriptions for any one library; instead they illustrate how selected ARL members are planning for or dealing with particular issues. The worth of any one Kit to a particular library will depend upon the specific topic covered and the library's stage of development in that area.

Materials are selected according to the following criteria:

- Presents an approach of potential value to administrators and decision-makers
- Timely, and dealing directly with the topic under consideration
- Probability of application of ideas or thinking to other library situations
- Illustrative of actual practice, rather than theoretical
- Understandable, readable communication

All together, the materials should provide a range of alternative approaches that complement each other, provide variety, and stimulate comparison and contrast.

Libraries can take advantage of the Kit compilations in a number of ways. Administrators can evaluate the assumptions, methods, and results of other libraries' approaches; compare and contrast them; and use the learnings in their own situations. Library staff members can use the kits as professional development and current awareness tools. Committees and task forces can use them to begin a review of current practices. And the Kits can identify other persons or places to contact for further information. Back-up files in the SPEC office also are available for loan to member libraries. In addition, SPEC will conduct on-demand surveys or analyses geared specifically for a single library.

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University of Pittsburgh

30 REQ # W 041384 10-01
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March 1984

UNIVERSITY LONG-RANGE PLANNING POLICIES (1985)

Institutional Overview and Description of Process

FOREWARD

The planning process which the University initiated about ten years ago leads to another cycle at this time. Our first effort produced the document entitled *The University Plan*, and the second cycle, about five years later, developed the *University Planning Policies for the 1980s*. Now, as we approach the midpoint of this decade, it is again appropriate to re-examine our organizational structure and programs. We are entering a new phase which must address the qualitative development of the University. This can only be accomplished through the setting of priorities. We must examine current and potential new programs that will permit the University to continue to grow and serve its many clienteles.

This communication sets forth goals and background for the forthcoming phase of University planning, specifying action requirements for heads of responsibility centers. This planning effort will involve wide participation of faculty and staff. The contents of this document are a product of much serious thought and discussion: While the contents could be further refined, it is more important that we get on with our assignments.

I have asked Provost Roger Benjamin to oversee the planning process for all schools and other academic entities of the University with the cooperation of Senior Vice Chancellor Nathan Stark. Senior Vice Chancellor Jack Freeman will lead the planning process in the Offices of Administration, Public Affairs, and Secretary, as well as my own office. Additional information will be made available by each of these officials as we progress through the coming months of effort. Our intent is to complete planning activities by January 1985, so the results can be available for consideration in the development of the fiscal year 1986 budget.

I ask every responsible person to assign this planning effort the highest priority and to involve extensively the faculty and staff. It is imperative that we take prompt advantage of all options available to us. Much of significance has happened at the University in the past five years, external conditions for our operations have changed substantially, and important opportunities are at hand.

Wesley W. Posvar

Wesley W. Posvar
Chancellor

THE UNIVERSITY IN TRANSITION—GENERAL GOALS

Since 1978-79 when we were developing our *University Planning Policies for the 1980s*, much has happened to warrant a re-examination of our priorities and plans for the remainder of this decade and beyond. Externally, besides the experience of a national recession and high inflation, our regional economy is undergoing a fundamental transformation, symbolized by the simultaneous abandonment of basic steel mills in our river valleys and construction of imposing new office buildings in the Golden Triangle. The evolution of an interdependent world economy has accelerated. Computerization and telecommunications developments and the whole technology of an emerging information society have outrun the expectations of five years ago. We have put in place new policies and procedures to accomplish some reduction of personnel—a position control system and early retirement incentive program are two examples—and we now can foresee more clearly than we could five years ago the size of faculty and staff we will need. The University has established significant new centers to mobilize its faculty and other resources for multidisciplinary and interinstitutional collaboration on technological and economic development and on health research and services. Internally, the University has experienced changes in leadership, including the provostship and several deanships.

As we approach the University's 200th anniversary in 1987 and look beyond to what we will bequeath to the 21st century, we must in all our planning be mindful of certain enduring and pervasive values of which we are the custodians. Foremost among these is the enhancement of the University's academic excellence, the quality of its faculty, students, and programs, its status and prestige. Second only to that is the maintenance of our institutional viability—the University's financial soundness and operational effectiveness. The first can be pursued only as long as the second is preserved. For us to be faithful to both our predecessors and our successors, these two considerations must guide and inform every aspect of our planning. While academic excellence and institutional viability are ever fundamental, the proximate and particular priorities suggested for the years immediately ahead are the following.

To invigorate our capability for and performance in research and scholarship—the production of knowledge—as the function which most clearly distinguishes a great university.

We must acknowledge that neither this nor any other university will command sufficient resources to contribute significantly in every field; therefore, we must identify where our greatest potentials lie, where concentrating our finite resources promises to be most productive. This means that some programs of research and scholarship and some departments and schools which have proven capability should receive optimal funding, while those with the potential to achieve that status are reasonably supported in their efforts to do so. Others should be candidly recognized as having a future here primarily in instructional or support roles and should be maintained accordingly. Some programs should be diminished. We must, in short, establish priorities for University support recognizing the valued function of research and scholarship as a deliberate strategy for achieving eminence.

As a further strategy in respect to this goal, the University should facilitate in every way available to it the mobilization of multidisciplinary talents for addressing significant research tasks. This means exercising ingenuity and boldness in organizing faculty members into supra-departmental, interschool programs or centers, making necessary adjustments in the personal reward system, and adapting the budget and allocation system to encourage and support multidisciplinary activity. Not all, certainly, but a great many of the most significant research tasks challenging society will be so complex as to require transcending traditional disciplinary and even institutional boundaries, and the University should extend its organizational flexibility to perform in this way. We already hava available several excellent examples of what this strategy can achieve—the Learning Research and Development Center, the University Center for International Studies, the University Center for Social and Urban Research, the Center for Environmental Epidemiology, and the new Pittsburgh Nuclear Magnetic Resonance Institute. The success of these organizations should encourage us to press further in this direction.

To recognize the University's contribution to the national economy as being significant in itself and so to assist the western Pennsylvania region's economic transformation and improvement in quality of life, with which the University's own future is inextricably linked.

We have begun recently to develop an array of new collaborative relationships between the University and businesses, governments, and other institutions for the purpose of accelerating the application of basic research to the benefit of society. Locally this would include adapting our region to a high technology and information-based economy. Examples are the NASA Industrial Applications Center, the Bituminous Coal Research Center, the Foundation for Applied Science and Technology, and the Western Pennsylvania Advanced Technology Center. While pushing ahead vigorously in this direction, we must plan carefully to assure that our efforts at economic stimulation as a community service not only gain public support for the University but also complement and enhance, rather than divert and detract from, the quality of our performance of our basic missions of research and teaching. The sheer size of the University's operation in the regional economy creates an obligation which, while certainly not new, is more critically important now than ever before, that of exercising prudent leadership in devising collaborative endeavors for economic revitalization of our own region.

Beyond that, though, our ability to attract and retain superior faculty and students will be significantly affected by general quality-of-life considerations in this region. Hence we should be planning ways in which our professional schools and academic departments can contribute to the improvement of the cultural opportunities and social amenities, the bealth services and environmental wholesomeness, the civic vitality and local government effectiveness to be found here. Again, while this is not a new role for the University, we should renew and intensify our commitment to our region's welfare in planning for our own future.

To sustain and improve the quality of instructional programs and to stimulate adaptive change and innovation.

Imprecise as our predictions may be, we can be quite confident that the pace and scope of change in higher education curricula and instructional technology will continue to be pressed by the knowledge explosion and societal developments. If our instruction programs are to remain vital and responsive both within departments and schools and at the overall institutional level, we should anticipate the need for rapid response and prepare for dealing expeditiously with specific program initiatives as they are generated. Our collegial mode of academic decision-making and our methods for redeploying resources should be honed to optimal effectiveness for keeping the University's instructional programs up-to-date.

Little prescience is required to identify some of the directions in which we will want to move. Courses of study need to expand more into international dimensions. More of our graduate and undergraduate programs need to be made accessible at times and places that working people can attend. Provisions for recurrent education during the course of people's lifelong careers need to be expanded. Computers, telecommunications, and technologies yet to appear will affect both how and what we teach. The University as a whole and each of its teaching units should plan for establishing and maintaining conditions conducive to individual faculty initiative for adaptive change and innovation in their own teaching and to school and department initiative in instructional program development.

To develop a technological "state-of-the-art" campus that keeps up continuously with evolving computer and telecommunications technologies in their constructive application to research, instruction, and administration.

The University already has underway substantial efforts in this direction: most especially we have collaborated with AT&T and other industrial constituencies to develop the "Campus of the Future" and to acquire a new generation of computer facilities. Some of this effort has to be acknowledged as being catch-up, and all of it should be recognized as being inevitably subject to change as the currently leading technologies progress and as new technologies emerge. The great challenge to our planning is to prepare the University to pursue a moving target. We should revise our collegial consultation practices, our budget and management procedures, and even our organizational structure with this challenge in mind.

Applying new technologies to the University's traditional functions will require scrupulous guardianship of basic academic values. Our planning should aim to assure that computerized administrative systems adapt to those values rather than impose different ones, that our curricula are not distorted by entrancement with the special capabilities of these new tools, and that scholarly pursuits that employ appropriate, but older and less glamorous, techniques are not neglected. This means not that we should back off from or enter hesitantly the high technology era of higher education but rather that, while vigorously advancing into it, we keep prominently in mind in our planning the fundamental purposes for which we are adopting such technology. We should keep clear the distinction between means and ends.

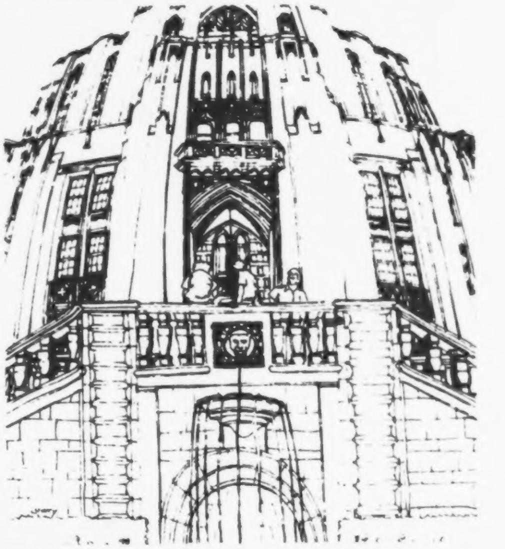
To evaluate and, where appropriate, restructure the University's organization for academic administration, its pattern of schools, colleges, departments, centers, and supportive service offices.

For reasons both of academic quality and economic efficiency, the University's planning should at this stage more than ordinarily focus on organizational restructuring possibilities. Realistically, for the University to pursue excellence under the conditions clearly predictable for the years ahead, we will have to resort to more rigorous and selective strategies for allocating resources—eliminating some operations, combining or consolidating others—thereby enabling us to concentrate support where we reasonably can expect to achieve the requisite quality. We should look particularly for complementary or related units which separately may have had more promise under earlier circumstances than they now have, but which through merger can achieve the critical mass necessary for contributing to the University's stature. We must avoid the alternative course of pushing across-the-board economies to the point where a general decline in quality is produced. While that approach is all too tempting in the short run in that it defers the making of hard decisions, in the longer run it invites institution-wide deterioration.

The University in recent years has made a number of changes in its programs, has experienced shifts in student interest and demand, and has instituted policies for necessary reductions; we now should look at changes in the way we are organized. One of our major aims in planning, therefore, should be to reflect such developments structurally and to shape an organization for academic administration that anticipates the future and permits the institution to emerge as a world-class university.

To improve the strength and well-being of faculty and staff.

This last stated objective is fundamental, for the faculty and staff of the University are its backbone. The prestige of the University and its excellence as an educational and research institution are directly related to the quality of the faculty. The quality of the faculty is in turn related to our ability to attract and retain scholars of excellence in teaching, research, and service activities. Its quality is also a reflection of its composition, involving a rich distribution of talents and a full representation of minorities and women, the product of a firm policy of equal opportunity. All of this requires vigorous recruitment of quality people, for both faculty and staff, and the maintenance of an environment of culture and intellectual amenities that is highly attractive and an inducement to remain a part of it. Libraries, facilities, and computers are important to this purpose; financial compensation is basic. To offset the erosion of real income during previous years of inflation and, more importantly, to reward faculty and staff for superior performance, it is important to increase salaries generously, as a priority in resource allocation decisions. Sustaining an outstanding faculty and staff will make everything else possible.



DEVELOPING PRIORITIES AT THE UNIVERSITY OF PITTSBURGH

The Planning Perspective

Universities, like all institutions, must continually adapt to meet the changing demands of the world in which they exist. Clearly, the period of tremendous growth and expansion is over. The period 1985 to 1990 will be a period of decision and implementation—one in which unpopular choices will have to be made to maintain the vitality of the University in its dedication to excellence in teaching, research, and public service.

The University has become an internationally recognized graduate/research and undergraduate educational system. The University is now experiencing the healthy dynamic tensions which often result from such a major transformation. The imperative for excellence in research, as well as in undergraduate and graduate programs, must be considered in conjunction with the imperative to serve the citizens of Pennsylvania, regardless of ethnic background or economic status.

In the growth environment of the 1950s and 1960s, universities could add new programs to meet new challenges and expand existing programs through real budget increases. Terms like "retrenchment" and "reallocation" were not a part of the administrative vocabulary. Major universities, like the University of Pittsburgh, were in a period of building, and the chief roles of the deans and central administrators were to recognize the merit of new ideas and to fund them. Today with declining resources, "retrenchment" and "reallocation" are recognized concepts. The current educational and general budget of the University in constant dollars is about $6 million less than it was in 1977; and over the past nine years, approximately $25 million has been reallocated within the University. So far, resources have been reallocated without seriously jeopardizing programs of high quality, but to continue to do so will require major program choices to be made beyond the reallocation that has occurred over the past decade.

Five key objectives must be met through the University-wide planning effort for the period 1985 to 1990. The first is to preserve and enhance programs of high quality in light of the University's expanded mission over the past 25 years. The second is to respond to the steadily evolving demands and needs of society for diverse educational opportunities. The third is to meet increasing costs for equipment, salary increases, utilities, computers, telecommunications, physical plant maintenance, fringe benefits, and so on, given a declining resource base. The fourth is to mitigate the serious effects of the projected decline in the traditional student-age population. Demographic projections for the areas from which most of the University's undergraduate students are drawn show a decline of almost 25 percent in the pool of college-age students over the next decade. Unless there is intervention through better recruitment and programs to attract a larger share of that pool, enrollments can be expected to decline sharply in the years ahead. Finally, most planners agree that in the evolution of any institution, there are points at which it is important to make an institution-wide comparative assessment and establishment of its priorities. The University of Pittsburgh is at such a juncture. What is now needed is a planning process that helps set the priorities of the University and develops strategies to meet the goals implied by these priorities toward the overall objective of an increasingly strong and dynamic institution.

In 1975, the University implemented the Planning and Resource Management System (PRMS) to establish a systematic approach to planning, budgeting, and program evaluation for its academic and administrative units. *The University Plan*, covering the period 1976 to 1979, represented the first effort to define the overall mission, goals, and programs of the University. With the approach of the 1980s, the University undertook a study of the major factors that might affect higher education during the period 1980 to 1990. The results of that study, including recommendations to facilitate the achievement of the University's goals, were used to develop the *University Planning Policies for the 1980s*. The *Plan* of 1976, followed by the *Policies for the 1980s*, together with the *PRMS Procedures Manual*, have guided the University's planning and budgeting process.

Although these procedures were beneficial in the past, modifications are necessary so that the future needs of the University can be met. First, the PRMS introduced vigorous evaluation of new proposals into the budgeting process. While the PRMS permits an assessment of the academic merits and costs of discrete proposals, however, its capability for determining the relative merit that should be given the new proposal as compared to other PRMS proposals and other programs already in place should be improved. Second, although the PRMS permitted the necessary reallocation of resources to meet mandated cost increases and new programs as the fiscal flexibility of schools declined, the Priority Assessment Fund process made it necessary for some deans to retrench core programs of high institutional value. At the same time, some schools secured funding of PRMS proposals for initiatives that were sometimes peripheral to University-wide priorities. Third, without agreement on long-term, University-wide academic priorities to guide resource allocation decisions, the priority assessment effort tends to be a year-to-year cycle that loses sight of University priorities. Central administrators, deans, and department heads can plan more successfully on the basis of goals to be reached over a period of several years. Fourth, efforts should be increased to encourage and develop faculty consultative mechanisms that will generate the academic priorities of departments, schools, and the University. Without these faculty consultative procedures, it is difficult to reach agreement on a set of programmatic priorities at the institutional level that sensitively reflect the aspirations, needs, and advice of the units that really undergird the University, specifically programs, departments, and schools. It is time to modify the planning process, as defined by the PRMS, by the setting of well-defined, University-wide academic and administrative priorities as the basis for resource allocations. The budgeting process also will be revised to replace the Priority Fund Assessment procedures with an effective and equitable means for internal reallocation of funds.

University-wide planning efforts as complex and difficult as this are usually carried out over an extended period of time. It is important, however, to begin to implement decisions based upon this planning process for fiscal year 1986. The planning will not end there. Planning is an ongoing, iterative process that will continually evolve, and as it does, it will guide the long-term budgetary decisions of the University. Vice chancellors, deans, department chairs, directors, faculty, and staff will participate in the planning process of each responsibility center.

Concurrent with the basic academic and administrative planning processes described in this section, a revision of the current Planning and Resource Management System Procedures Manual will be undertaken by the Office of Planning and Budget in consultation with the Chancellor, the Executive Staff, and the University Planning Advisory Council. These changes will reflect the revised planning processes and a new approach to budgeting.

The Academic Planning Agenda

The fundamental goal of this process is to provide the Office of the Provost with a proper understanding and appreciation of each unit's academic priorities and plans to serve the foundation for academic decision-making. The results of the process will help the University to preserve programs of nationally recognized excellence, to improve programs that have already demonstrated high quality and potential, to continue as well to improve commitments to equal educational opportunities and affirmative action, and to initiate new programs capitalizing on opportunities in a changing environment. As part of the academic planning process, a Faculty Task Force on Planning, of approximately 15 members, has been appointed to advise the Office of the Provost. Additional faculty input will occur through the individual departmental planning processes and the various faculty committees of the University Senate.

Basic priorities among academic responsibility centers will be defined by the mission statement of the unit and the institutional planning statement. In setting priorities among programs and services within responsibility centers, however, the plans should address the following criteria.

a. Quality: Inevitably a subjective measure, quality includes the quality of the faculty (in teaching, research, and service as reflected in peer national ratings), the quality of students, library collections, and so on.

b. Centrality: Each program should be evaluated in terms of its contribution to the mission of the University of Pittsburgh, specifically, the degree to which the program is an essential component of a challenging liberal, preprofessional, or professional education which instills an understanding of the major ideas and achievements of mankind and a sense of the values of our own and other cultures and ages and its contribution to the University's goal of providing equal opportunity for all of the citizens of the Commonwealth, as well as the University's commitment to affirmative action.

c. Demand and Workload: Both short- and long-term demands (increasing, stable, or declining) for each program will be considered. Demand indicators might include applicant flow rates, quality of acceptances, services performed in support of other programs, instruction of students and/or research for the solution of pressing societal problems, and the prospective market for graduates. If a program has suffered a substantial decline in workload, the program should be asked to justify its existence and its budget.

d. Cost Effectiveness: Because aspirations are always limited by the resources available, programs must be continually examined to see if more economical or more efficient ways are possible to accomplish the same ends. Yet, cost alone must not govern the decision; the effectiveness of the program must also be weighed. When taken together, cost and effectiveness provide one important measure of whether funds are being put to the best use.

e. Comparative Advantage: What is the rationale for the program at the *University of Pittsburgh?* What are the unique characteristics of each program that make it *essential* to the community, region, nation, and/or other University programs?

Timetable

The planning process will be organized in the following four phases.

Phase I:	**March–June, 1984**	Responsibility Center Planning
Phase II:	**July–October, 1984**	Preliminary University-wide Priority Setting by the Faculty Task Force on Planning, and the Office of the Provost
Phase III:	**November-December 1984**	Discussion of the Preliminary Planning Documents with Responsibility Centers, Senate Committees, University Planning Advisory Council, and the Office of Planning and Budget
Phase IV:	**January, 1985**	Recommendations for University-wide Priority Setting for Action by the Chancellor and Board of Trustees

Phase I: Responsibility Center Planning

To ensure the success of this planning process, faculty consultation is of utmost importance, and this is particularly critical in Phase I. The objective of Phase I (March through June for the smaller units and through July for the larger units) is to have each academic responsibility center draft a plan which shows its preliminary decisions on program priorities as a part of its long-range plan. Each school must evaluate and rank its programs as they relate to the educational structure of the University as a whole. Programs central to the University's mission should be given relatively high priority. Inasmuch as overall societal needs are often greater than any single institution's capacity to fulfill all of them, special weight should be given to those programs that not only fulfill societal needs but are appropriate to the University's academic strengths, resources, and mission. The Office of Planning and Budget and the Office of the Provost will assist in providing available, relevant planning data.

The planning document, described below, must include a mission statement, a statement of goals and objectives, a plan based on an assumed 25 percent budget reduction over the next five years, and a supplement to that plan which shows how additional resources would be used to strengthen existing programs and to support new programs of highest priority. The intent of this planning process is to develop agreed upon academic priorities so that the reallocations proposed can be considered in the context of University-wide needs. *It must be emphasized that this is not an exercise in across-the-board budget retrenchment. It is an attempt to provide the basis for funding high-priority programs and initiatives.*

The Phase I planning document should include the following.

a. Mission statement of the responsibility center must address the overall purpose of the center and the component programs.

b. Goals and objectives must be provided specifically with a five-year *projection* covering structure and functions of the responsibility center, program quality, enrollment, equal educational opportunity goals and commitments to affirmative action, and so on, under the assumptions described below in c and d.

c. University resources will be constrained over the next five years. Although the precise severity of this constraint is not known, for the purpose of this planning process the assumption is made that the base budget of the responsibility center will be reduced in stages by 25 percent in real terms over the next five years. Programs of the responsibility center are to be ranked in terms of their relative priority using the above criteria: those programs that should be accorded increased support, those programs that should have a steady state budget, those programs that should be reduced in size and/or merged with other programs within the responsibility center or other parts of the University, and, finally, those programs that should be phased out should be identified. The University is committed to meet its obligations with respect to tenured faculty. Consideration of tenure, however, should not constrain the planning effort, and reference should be made to *University Policies Relating to Reorganization or Termination of Academic Programs*, January, 1981.

d. Under the assumption that sufficient funds will be recaptured to provide support for new programs and to strengthen existing programs of highest priority, a description is to be provided of how the center, in relation to the University as a whole, might excel or gain national prominence through an allocation of additional resources. Proposals for new efforts should be ranked in the order of priority and include an estimate of the level of resources required to implement each initiative.

Phase II: University-wide Priority Setting

The Office of the Provost and the Faculty Task Force on Planning will work together to develop an overall plan for the primary functions of the University which are, in equal measure, the preservation, development, and dissemination of knowledge. All other activities, tasks, and services are instruments to that end. Each program will be evaluated in terms of its relation to the educational mission of the University as a whole, and each will be assigned a rank in one of four categories: (a) new programs and/or increases to existing programs, (b) programs for which there will be no change, (c) programs earmarked for reductions in size and/or recombinations, and (d) programs to be phased out.

Phase III: Conferences with Major Planning Units

During Phase III, discussions will take place with each responsibility center to clarify the intentions of the unit plans through a series of queries. A specific University-wide agenda will be pursued, as well as the issues that may be unique to a particular unit. With the advice of the Faculty Task Force on Planning, the Senate Committees, the University Planning Advisory Council, and the Office of Planning and Budget, the Provost will develop a preliminary overall academic plan for the University. Guidance will be offered to the deans and directors to further refine program priorities. At the conclusion of the planning conferences, the agreements reached with each dean or director will be set forth in an initial planning memorandum and, subsequently, incorporated by the Office of the Provost into a draft University academic plan. That plan will be sent to the deans and directors, Senate Committees, University Planning Advisory Council, and to the Chancellor and his Executive Staff.

Phase IV: Recommendation for University-wide Planning and Resource Allocation

The University academic plan developed by the Office of the Provost will be reviewed by the Chancellor and his Executive Staff. Following the Chancellor's review of recommended programmatic and budgetary changes for a particular unit, additional conferences with major planning units may be required to clarify or modify the contents of the initial planning memorandum. The Chancellor will present specific recommendations to the Board of Trustees, after which the Provost will meet with the heads of responsibility centers to translate program priorities into the fiscal year 1986 budget which will be used to prepare the final policy memorandum for each responsibility center.

The plan will also contain a series of recommendations requiring additional study. An analysis of these recommendations will become part of the second cycle of the planning process which will commence in early 1985.

The Administrative Planning Agenda

The goal of the administrative planning process is to evaluate carefully and objectively each administrative program with respect to several specific criteria and to establish the priority of each program relative to University needs as the basis for allocating available funding. To the extent that reallocation of funds may be necessary, programs of lowest priority will be reduced or terminated in order to nourish those programs of higher priority. Since most administrative programs exist primarily to provide academic, student, or institutional support, such reductions or terminations can be expected to affect adversely the levels of service that administrative support units will be able to provide. Within the limits of available resources, however, every effort will be made to continue to provide essential services at reasonable levels of quality and responsiveness. The Senior Vice Chancellor for Administration will be responsible for coordinating the administrative planning process.

Phase I: Program Evaluation (March-April, 1984)

1. The heads of each administrative responsibility center will identify specific programs for evaluation. For purposes of this review, a program is defined as a distinct functional activity separable from other activities within an administrative unit, even though it may share resources with other activities and may not be separately budgeted: for example, the learning skills program in the Counseling Center, the audit group in the Office of Budget and Audit, the mail room in the Office of Management Services, the publications program in the Office of News and Publications.

2. Programs will be assigned to one of the following categories.

   a. Institutional support—all activities related to the central executive-level management and planning of the institution; fiscal operations, administrative data processing, and space management; employee and personnel records; security, printing, transportation services, storerooms, and procurement; and community and alumni relations are included.

   b. Academic support—support services directly related to the functions of instruction, research, and public service (libraries, museums, and galleries; demonstration schools; media and technology; and academic administration) are included.

   c. Student services—activities related to all aspects of student development beyond formal instruction and those of the registrar and admissions are included.

   d. Operation and maintenance of physical plant—operating expenses for the entire physical plant are included, as well as utilities, fire and property insurance, and similar items.

   e. Auxiliary enterprises—all activities which are self-supporting including book stores, the football program, and food service.

3. The head of each responsibility center will complete a data collection form for each program under his control. The form includes identifying information (responsibility center, budgetary unit, title of the program, program category, and name of the program supervisor), major functions performed in the program, annual budget, full- and part-time staff by classification (as well as any approved vacancies), location and amount of space assigned, special equipment requirements, and performance measures, such as the number of students or faculty served, number of reports generated, and so on, which are to be used in evaluation.

4. The head of each responsibility center will evaluate independently each program under his control on the basis of the following criteria and will complete the program evaluation form.

   a. Centrality. To what degree is this activity essential to the University's operations? What would be the effect of a decision to reorganize, reduce, or terminate this program? Can this function be performed by another unit?

   b. Organizational Relationships. With what other programs does this activity relate and in what ways? Is the organizational location of this program optimal? In a reorganization, where should the activity be located to optimize its performance?

   c. Cost Effectiveness. Relative to available resources, how well does this program perform its functions? What are its strengths and weaknesses? Could this function be handled effectively in some other way? How can efficiency be improved?

   d. Demand. Whom does this program serve? What is the current and projected demand for its services? Is the demand fixed or variable? If variable, in response to what factors?

   e. Income Generation. How would income generation be affected by a reduction or increase in this activity? How can income be increased? At what cost?

   f. Potential for Resource Redistribution. If this activity were reduced or terminated, what resources could be reallocated to other activities? What resources would be lost?

   g. Timeliness. Would a change in this program be timely or opportune in view of anticipated personnel retirements or resignations, changes in demand, or other variables? If a reduction or termination of this activity becomes necessary for budgetary reasons, what would be the optimum time to make such a change? How long would be required to phase out the program?

5. After evaluation, the Senior Vice Chancellor for Administration and the Vice Chancellor for Planning and Budget will meet with the head of each administrative responsibility center to review the evaluation of each program and will assign each program to one of the priority categories.

   a. Priority One: Those activities that should receive highest priority for allocation of *additional* resources;

   b. Priority Two: Those activities that should continue to be funded at approximately *current* levels;

   c. Priority Three: Those activities for which funding can be *reduced* or *eliminated* in response to budgetary limitations.

Phase II: Planning (May-October, 1984)

1. Based upon the foregoing evaluations and priority decisions, the Senior Vice Chancellor for Administration, in consultation with the heads of the administrative responsibility centers, the Executive Staff, and the Chancellor, will develop a proposed administrative plan for the period fiscal year 1986 to fiscal year 1990.

2. The Senior Vice Chancellor for Administration will review the proposed administrative plan with the Office of Administration liaison committee of the Senate Budget Policies Committee, other appropriate Senate Committees, and the University Planning Advisory Council for their comments and suggestions. Based on these decisions, the plan will be revised in consultation with the heads of the responsibility centers.

3. The revised plan will be presented by the Senior Vice Chancellor to the Executive Staff and the Chancellor for review and approval. Where the head of a responsibility center disagrees with the priority assigned to a program by the Senior Vice Chancellor for Administration, he may submit to the Chancellor and Executive Staff a brief statement of his views for their consideration.

Phase III: Implementation (October, 1984-January, 1985)

1. The final plan will be presented by the Chancellor to the Board of Trustees for approval. Copies of the approved plan will be sent to the head of each responsibility center who will be responsible for implementing the plan under the guidance of the Senior Vice Chancellor for Administration.

2. The Senior Vice Chancellor for Administration will monitor the implementation of the approved plan and will submit regular progress reports to the Chancellor, the heads of the responsibility centers, and the University Senate.

BACKGROUND FOR PLANNING

Mission and Goals of the University of Pittsburgh

The University of Pittsburgh, founded in 1787, is one of the oldest institutions of higher education in the United States, and the first to be established west of the Alleghenies. The University has maintained a distinguished record of quality educational service to the City of Pittsburgh, the Commonwealth of Pennsylvania, and the nation. It stands today among the front rank universities in the country. Consistent with its historic commitment to high academic achievement, an overriding aim of the University is to enhance further the quality of its programs of teaching, research, and public service and to maintain the stature and prestige of the University, its schools, faculties, and graduates.

In carrying out its mission during the next decade, the University shall:

engage in research, artistic, and scholarly activities that will advance learning and extend the frontiers of knowledge . . .

offer superior graduate and professional programs that will respond to the needs of Pennsylvania, as well as the broader needs of national and world society . . .

provide high-quality undergraduate programs in the arts and sciences, and preprofessional fields, with emphasis upon those of special benefit to Pennsylvania . . .

offer continuing education programs adapted primarily to the personal, professional, and career interests and needs of adults . . .

make available to local communities and public agencies the expertise and educational services of the University, in ways consistent with its primary functions of teaching and research . . .

provide leadership and cooperate in the development of academic programs with public agencies and other colleges and universities to meet the educational needs of the region and state.

By its very nature, the University defies simple description. It shares with other universities the traditional responsibilities for teaching and research, and through these public service, which reach across the spectrum of human concerns. The distinctive character of the University, however, is defined by its commitment to academic excellence, its specialized programs, and the unique array of scholarly interests and talents represented among its schools, campuses, institutes, and centers. Thus, the mission of the University encompasses a range of varied undertakings and, in a sense, may be viewed as the sum of the missions of its academic divisions. While the University's mission is broad, its underlying coherence gives direction to the institution as a whole and to its component parts.

In its most basic sense, the mission of the University is the advancement of learning. This purpose stems from the objectives of the University's founders and is carried out in the framework of traditions and tasks developed and shared by the higher education community. The University seeks to discover, evaluate, preserve, and disseminate knowledge; to promote the intellectual growth of students; and to stimulate both faculty members and students to the further pursuit of knowledge and understanding. Essential to the achievement of the University's mission are institutional autonomy, freedom of inquiry, high professional qualifications for faculty, and challenging academic standards. Excellence in research, scholarship, artistic creativity, and teaching is vital to the achievement of the University's purposes.

The University also recognizes a natural and necessary linkage between acquisition of knowledge and its application to societal goals. Within a framework of liberal education, the University provides opportunities not only for intellectual discovery but also for career preparation. The University's commitment to the strength and diversity of its schools' programs, the expertise of its faculty, and its unique relationship to one of America's major urban centers enhance its capacity to foster mutually advantageous relationships with the society of which it is a part and from which it derives its sustenance.

A distinguishing characteristic of the University is the international dimension of its programs, which links the University to educational and research activities in other countries around the globe. This brings to the University faculty and students of varied cultural backgrounds and enriches the intellectual climate of the entire institution.

At the national level, the University bears important responsibilities for contributing to the economic, intellectual, and social development of the country and engages in a variety of programs in cooperation with other universities, public agencies, private associations, foundations, and business corporations throughout the United States. The continuation and enlargement of these relationships contribute to the national and international prestige of the University and are necessary to its intellectual vitality.

Equally important is the University's obligation to serve the people of western Pennsylvania, who for almost two hundred years have furthered its growth. As the only comprehensive, publicly-supported institution in the region, the University addresses the higher education needs of western Pennsylvania, provides educational leadership, and promotes cooperation among the region's colleges and universities.

By virtue of its location in the heart of a great city and its expertise the University has a special opportunity and responsibility to address the problems of metropolitan life. The increasing concentration of large populations in metropolitan areas is a world-wide phenomenon which generates many of the most critical problems of contemporary society. The University encourages programs of research, teaching, and service in areas related to urbanization, such as mass transportation, housing, education, health care delivery, and industrial development, using the Pittsburgh metropolitan region as a natural laboratory.

The programmatic activities of the University, derived from its mission, are a means for translating that mission into action. In developing and carrying out its programs, the University recognizes not only its commitment to academic excellence but also its obligations to society. While preserving the best traditions of the academy, the University encourages creative innovation and planned progress within an adaptive structure that permits the University to be responsive to the needs of a society characterized by rapid change.

Excellence in basic research is the hallmark of a distinguished university, and the University's commitment to research and graduate and professional education is its most distinctive characteristic. The University also shares with industrial and governmental institutions responsibility for applied research, particularly within its professional schools. Research, graduate, and postbaccalaureate professional programs are intimately and inseparably linked. Graduate faculty members and advanced students, working together, are the keys to creative research and effective teaching at the graduate level. The University gives high priority to continued qualitative improvement in its research, graduate, and postbaccalaureate professional programs to serve Pennsylvania, the nation, and the world.

A vigorous and challenging undergraduate program is vital to the University's basic purposes. Creative programs in the arts and sciences and the professions promote intellectual development, personal enrichment, social awareness, and career preparation of undergraduates. Undergraduate programs of the University are rooted in the tradition of liberal education, emphasizing the fullest development of the individual's personality and abilities as well as the acquisition of knowledge, competencies, and values essential to personal and professional achievement. The University recognizes both teaching and research as essential to the professional development of the faculty and encourages the involvement of senior faculty members in its undergraduate teaching programs.

The University offers an environment that facilitates interaction between undergraduates and faculty engaged in research at the frontiers of knowledge, responds in innovative ways to student needs, and provides a stimulus of special importance to students who plan to continue studies at the graduate level. The University is committed to excellence in teaching and continued improvement in the quality and scope of its undergraduate programs to serve the educational needs of Pennsylvania and the region.

A growing number of Americans view education as a life-long process. Earlier retirement affords more time for mature persons to enrich their lives through education; the average period of formal education is lengthening; and larger numbers of working adults are returning to school for personal enrichment, professional upgrading, and career advancement. To meet these new needs, the University offers continuing education programs to promote human development and cooperates with other higher education institutions to provide diversified educational opportunities for adults.

The role of the University in public service is related to the institution's commitment to social progress and community improvement. Its public service responsibility is fulfilled primarily through its programs of teaching and research and the availability of its expertise to local communities and public agencies. The services the University performs for society, therefore, must be consistent with its primary educational role and should not detract from its central functions of teaching and research. Within these constraints, the University seeks to strengthen its cooperative relationship with the community of which it is a part by providing educationally-related services of benefit to the public.

The faculty, administration, and trustees of the University are dedicated to achieving this mission, to which they pledge their individual and collective efforts, determined that in the years ahead the University shall remain among the most distinguished institutions of higher education in the nation.

Review of University Developments, 1979 to 1984

Building on almost two hundred years of academic service and tradition, the University must be conscious of its position in the higher education community if it is to plan competently for future change. The most recent institution-wide planning effort, completed in 1979 and set forth in *University Planning Policies for the 1980s*, established specific goals and objectives for the first five years of the current decade, many of which have been or are in the process of being completed. The following section briefly summarizes the University's programs of instruction, research, academic support, student services, institutional support, and physical plant and the resources that sustain them—student enrollments, faculty and staff personnel, and finances.

Programs

Five major instructional goals were set forth for the 1980s: (1) to enhance the quality of academic programs, (2) to develop career options for liberal arts students, (3) to develop inter- and multidisciplinary programs, (4) to improve access for a broader range of students, and (5) to revise, with limited resources, programs to meet changes in demand. Since 1979, over 25 program evaluations have been conducted by the Office of the Provost, and major curricula changes have been made in the Colleges of Arts and Sciences and General Studies and the Schools of Education, Public and International Affairs, Pharmacy, and Public Health.

A number of new undergraduate career-oriented programs were begun at the Pittsburgh and regional campuses, including an undergraduate program in Library and Information Science and an undergraduate business option in the College of Arts and Sciences. Similarly, at the graduate level, more career-oriented programs were added, such as the master's programs in applied mathematics and in applied statistics. Dual degree programs were established between the School of Law and the Graduate Schools of Public and International Affairs and Business and with two schools at Carnegie-Mellon University. Other new programs include the Drug Information Specialist program in Library and Information Science and Pharmacy and a dual degree program between Social Work and Hebrew Union College in Los Angeles.

The goal of improving access was addressed in several ways. Through the College of General Studies, a student can now complete a degree completely within the External Studies Program; other options include a program of part-time study during the day and a Saturday College. Evening and part-time master's programs were begun in Public Health, Nursing, and Social Work.

Finally, from a mangement perspective, new policies and procedures were established—*University Policies Relating to the Reorganization or Termination of Academic Programs* and *Guidelines for Conducting Evaluations of Graduate Programs*, and long-range plans were developed for Law, Engineering, Administration of Justice, and Physics and Astronomy.

Research is a primary, distinctive mission of the University differentiating it from other publicly-supported institutions of higher education in western Pennsylvania. During the past five years, efforts have focused on the development of new externally-funded research programs and high priority research projects and centers, including biomedical engineering, environmental epidemiology, urban affairs, knowledge use, gerontology and geriatrics, and energy, energy policy, and environment. A number of new research centers were approved: Surface Science Center, Center for Applied Science and Technology, Knowledge Use Center, Long Term Care Gerontology Center, Hybridoma Center, Center for Environmental Epidemiology, and Pittsburgh Nuclear Magnetic Resonance Institute. Collaborative relations were established with other institutions and industries, including the Bituminous Coal Research National Laboratory, the Western Pennsylvania Advanced Technology Center, and the Foundation for Applied Science and Technology.

In the areas of academic support, student services, and institutional support, efforts were made to stabilize costs and eliminate program redundancy while meeting increased and diverse demands for quality services. In the student services area, the Office of Special Student Services was terminated, the Student Health Service was restructured, and the School of Education Placement Office was merged with University Placement. A number of school libraries were reorganized to form the University Library System. The University Computer Center, the Department of Athletics, and the Treasurer's Office also were restructured. Several administrative offices were merged: Plant Services and Building Maintenance with Facilities Planning; Institutional Research, Policy Studies, and Information Systems Planning; and the Offices of Budget, Management Analysis, and Internal Audit. Major program evaluations of the Offices of Physical Plant, Student Aid, Research, Faculty Development, and Evaluation of Teaching and the University Center for Instructional Resources were conducted.

Resources

Major efforts were made to achieve the enrollment goals set in 1979 for each school and campus while maintaining student quality. These efforts were quite successful, and in the fall term, 1983, the University attained its highest enrollment ever in its 200-year history, well above projected demographic trends. In addition, the University capped enrollments in Engineering, Business, Law, Health Related Professions, Medicine, and Information Science where demand exceeded capacity to provide quality programs.

Goals related to personnel resources focused on the maintenance and improvement of faculty and staff quality, the control of personnel positions, and the efficient use of personnel resources. Faculty and staff development programs were established during the past five years, including the Faculty Development Seminar Series and the Management and Staff Development Office. A formal staff evaluation system was instituted, as well as an exit interview program and a "Quality Circles" program. New personnel policies were instituted, including a faculty sick leave policy, revision of the TA/TF/GSA policy, personnel policies related to the merger and termination of academic programs, a faculty early retirement plan, and monitoring procedures for the approval of new positions. Finally, the University has promoted improved operating efficiencies through the procurement of new administrative software and advanced computing, telecommunications, and word processing equipment.

With regard to financial resources, University goals emphasized holding down tuition increases, increasing levels of support from other revenue sources, and internally reallocating resources. While tuition increases have exceeded slightly the general rate of inflation, they have been contained to the extent possible given levels of funding support from the Commonwealth. To facilitate student enrollment, the University instituted a deferred tuition payment plan. Increases in State support have lagged behind increases in the rate of inflation but in recent years higher education in general has received larger increases than other sectors of the State. State support has also been forthcoming for certain capital construction projects: Bradford Library and Administration Building, Titusville Student Union and Gymnasium, Medical Research Facility, renovation of Salk Hall and the Dental Annex, and reconstruction of Langley Lecture Hall. Annual giving has increased substantially, and the University has just completed a $50 million capital campaign. Income from sales and services has been growing at rates above inflation. Over the past nine years of applying its Priority Fund Assessment procedures, the University has managed to reallocate internally about $25 million to fund higher priority activities.

The Planning Environment

While the rampaging rate of inflation has subsided at least temporarily and recession appears to be bottoming out nationally, the context for the University's planning for the remainder of this decade and beyond is nevertheless a challenging one. As in the past, such demographic trends as the aging of the population and its geographic redistribution, such technological trends as rapid computer developments and the transition to an information society, and such socio-economic trends as the increasing proportion of women in the work force, the internationalization of business and industry, and the shift from an industrial to a service economy all remain factors that influence higher education. As a graduate research university, the University has to concern itself with the rising costs of competitive faculty compensation, laboratory modernization, and the organizational challenge of mounting critical masses of academic talent required to deal effectively with complex problems. All of these factors, of course, will vary in their impact on the University's responsibility centers, each of which must assess the effects on its programs and mission.

Career Opportunity Trends

A critical consideration for University planning is the problem of future career opportunities for its graduates. The Bureau of Labor Statistics has compiled a listing of occupations identified as generally requiring college or university training. Data are given for total national employment in 1980, the projected percentage increase in employment from 1980 to 1990, and the projected number of new positions by 1990 for each occupation. In 1980 the field of education dominated the top ten occupations as 3,528,000 persons were employed as kindergarten and elementary school teachers, secondary school teachers and college and university faculty. This total alone represented 27.4% of the persons employed in occupations requiring a degree. Physicians and registered nurses accounted for 1,529,000 jobs in 1980, and the remainder of the top ten occupations (accountants and auditors, manufacturer sales workers, lawyers, bank officers and managers, and social workers) accounted for 2,510,000 employed persons. In all, these ten occupations included 58.7% of the persons employed in the United States during 1980 in positions requiring college or university training.

Each year the University awards approximately 3,500 baccalaureate, 2,000 master's, 400 doctorate, and 450 first professional degrees. What becomes important to institutional planning, therefore, are the projected futures of those occupations, as well as where alumni seek those occupations. Alumni records show substantial differences among the schools as to the proportion of their graduates residing in the immediate ten-county region; most local in those terms are the College of General Studies (79.6%), Law (63.3%), and Education (61.4%), while the least so are the Graduate School of Public and International Affairs (30.4%), Graduate School of Public Health (35.2%), and the Faculty of Arts and Sciences (38.8%) with all others between those extremes. Table 1 summarizes those occupations provided by the Bureau of Labor Statistics according to the schools most closely aligned with the preparation of individuals for those careers.

Table 1

Summary of Number of Employees in Occupations Requiring Higher Education (1980) and Percent and Actual Change in Positions to 1990 Related to University of Pittsburgh Schools

	Number Employed 1980	Projected Percent Change 1980-1990	Projected New Positions 1990
Business			
Accountants & Auditors	900,000	29.5%	265,500
Bank Officers and Managers	400,000	29.5%	118,000
Systems Analysts	205,000	74.0%	151,700
Personnel & Labor Relations Specialists	178,000	18.5%	32,930
Credit Managers	55,000	0.0%	0
Market Research Analysts	29,300	39.0%	11,430
City Managers	3,300	21.0%	700
Education			
Kindergarten & Elementary Teachers	1,600,000	18.5%	296,000
Secondary School Teachers	1,237,000	−14.0%	−173,180
School Administrators	150,000	−1.0%	−1,500
Recreation Workers	138,000	18.0%	24,840
Student Personnel Workers	55,000	0.0%	0
School Counselors	53,000	0.0%	0
Dancers	6,500	21.0%	1,365
College Career Planning & Placement Counselors	5,000	0.0%	0
Engineering			
Electrical Engineers	325,000	41.0%	133,250
Mechanical Engineers	213,000	35.0%	74,550
Civil Engineers	165,000	28.5%	47,025
Industrial Engineers	115,000	32.0%	36,800
Occupational Safety & Health Workers	80,000	21.5%	17,200
Aerospace Engineers	68,000	47.5%	32,300
Chemical Engineers	55,000	27.5%	15,125
Construction Inspectors (Government)	48,000	27.0%	12,960
Metallurgical Engineers	15,000	37.0%	5,550
Agricultural Engineers	15,000	27.0%	4,050
Ceramic Engineers	15,000	27.0%	4,050
Industrial Designers	13,000	10.0%	1,300
Mining Engineers	6,000	44.5%	2,670
Biomedical Engineers	4,000	27.0%	1,080
Faculty of Arts and Sciences, College of General Studies, Regional Campuses			
Manufacturers Sales Workers	440,000	19.5%	85,800
Systems Analysts	205,000	74.0%	151,700
Purchasing Agents	172,000	20.0%	34,400
Buyers	150,000	23.5%	35,250
Musicians	138,000	18.0%	24,840
Agricultural & Biological Scientists	125,000	18.5%	23,135
Chemists	113,000	21.0%	23,730
Writers & Editors	110,000	24.0%	26,400
Psychologists	106,000	24.5%	25,970
Public Relations Workers	87,000	22.0%	19,140
Reporters & Correspondents	57,000	27.0%	15,390
Radio & TV Announcers & Newscasters	51,000	31.0%	15,810
Economists	44,000	29.0%	12,760
Mathematicians	40,000	12.5%	5,000
Physicists	37,000	11.5%	4,255
Speech Pathologists & Audiologists	35,000	48.5%	16,975
Geologists	34,000	29.5%	10,030
Statisticians	26,500	21.0%	5,565
Technical Writers	25,000	31.0%	7,750
Actors & Actresses	21,000	22.5%	4,725
Sociologists	21,000	7.0%	1,470
Historians	20,000	−9.0%	−1,800
Singers	19,000	15.0%	2,850
Biochemists	16,000	20.0%	3,200
Geographers	15,000	25.0%	3,750
Political Scientists	15,000	14.0%	2,100
Industrial Designers	13,000	10.0%	1,300
Geophysicists	12,000	29.5%	3,540
Actuaries	8,000	44.0%	3,520
Anthropologists	7,200	23.0%	1,655
Dancers	6,500	21.0%	1,365
Soil Conservationists	5,000	3.0%	150
Meteorologists	4,000	8.0%	320
Astronomers	3,000	5.0%	150
Oceanographers	2,000	17.0%	475
Law			
Lawyers	425,000	32.0%	136,000
Library & Information Science			
System Analysts	205,000	74.0%	151,700
Librarians	135,000	4.0%	5,400
Public & International Affairs			
Urban & Regional Planners	23,000	29.5%	6,785
Political Scientists	15,000	14.0%	2,100
City Managers	3,300	21.0%	700
Social Work			
Social Workers	345,000	22.0%	75,900
Occupational Therapists	19,000	67.0%	12,730

Table 1 continued

	Number Employed 1980	Projected Percent Change 1980-1990	Projected New Positions 1990
Dental Medicine			
Dentists	126,000	23.0%	28,980
Health Related Professions			
Medical Laboratory Workers	205,000	39.0%	79,950
Radiologic (X-ray) Technologists	106,000	39.5%	41,870
Medical Records Technicians & Clerks	55,000	46.0%	25,300
Respiratory Therapy Workers	50,000	52.0%	26,000
Dieticians	44,000	42.0%	18,480
Physical Therapists	34,000	55.0%	18,700
Occupational Therapists	19,000	67.0%	12,730
Medical Records Administrators	15,000	33.0%	4,950
Food Technologists	15,000	14.0%	2,100
Medicine			
Physicians & Oesteopathic Physicians	424,000	32.0%	135,680
Podiatrists	12,000	38.0%	4,560
Biomedical Engineers	4,000	27.0%	1,080
Nursing			
Registered Nurses	1,105,000	43.5%	480,675
Pharmacy			
Pharmacists	141,000	15.0%	21,150
Public Health			
Health & Regulatory Inspectors (Government)	112,000	13.0%	14,560
Occupational Safety & Health Workers	80,000	21.5%	17,200
University-wide			
College and University Faculty	691,000	−9.0%	−62,190

Source: Job Opportunities and New Careers, 1980 to 2000, Information Document Number 15, Office of Institutional and Policy Studies, Office of Planning and Budget, December, 1983.

Regardless of the particular school alignment, employment of systems analysts is expected to increase the most of all listed occupations by between 68% and 80% by 1990, and only three other occupations are projected to grow more than 50%, all of them—occupational therapist, respiratory therapy worker, and physical therapist—in the health related professions. Only eight of the listed occupations are projected to experience zero or negative growth. With the exception of credit managers, all of these are directly related to education. Almost no new openings are anticipated for school counselors and administrators, college student personnel workers, and career planning and placement counselors by 1990 over the 1980 levels. During the same period, overall employment of college and university faculty is expected to decline 9%, and that of secondary school teachers, by 14%.

As to the projected number of new openings, registered nurses exceed all other occupations with nearly an additional half a million needed nationally by 1990. Even though a lower growth rate is expected for kindergarten and elementary teachers, the creation of jobs for this group, as well as accountants and auditors, stands alone behind nurses with the demand approaching 300,000 new persons for each group by 1990. The most prolific growth in new positions following the top three are for systems analysts, lawyers, physicians, electrical engineers, bank officers and managers, and health service administrators. More than 100,000 new openings are anticipated in each of these fields by 1990. Only four occupations will experience declines in actual employment, according to the Bureau of Labor Statistics. The number of secondary school teachers is projected to fall by more than 173,000, and the number of college and university faculty, by more than 62,000. The numbers of school administrators and historians will each fall by less than 2,000. Engineering employment is expected to grow faster than the national average in every specialty field. The Bureau of Labor Statistics indicates, however, that demand for engineers overall will approximately equal the supply until 1990. Any shortages in the next decade are expected to be limited to a small number of specialties and be very short-term in nature.

Projections for the nation as a whole may well have only limited predictive value for a university as locally oriented as the University is at the undergraduate level. While not confined to occupations requiring higher education as the above data are, however, data in a February, 1984 report of the Pennsylvania Department of Labor and Industry on *Labor Market Projections for 1980 to 1990* do indicate directions of change in the State and local economies that may be relevant for institutional planning, even though they reflect all occupations, not just those requiring college or university training. They show that, for the State, health services are expected to increase by 135,400 jobs (42.4%), eating and drinking places by 66,500 (30.0%), business services by 48,500 (37.1%), social services by 42,200 (61.8%), and wholesale trade (durable goods) by 25,400 (16.4%). On the other hand, they show local government jobs declining by 35,300 (-8.0%), primary metals industry by 23,000 (-12.7%), apparel and other textile products by 16,700 (-15.1%), food and kindred products by 10,700 (-11.0%), and textile mill products by 8,600 (-19.5%). For Pittsburgh in particular the same report projects growing employment in private health services by 23,710 (35.2%), business services by 16,020 (53.9%), eating and drinking places by 12,200 (25.5%), special trade contractors by 8,600 (35.0%), and educational service (private) by 4,300 (18.1%). Shown shrinking here are government by 17,650 (-15.5%), primary metals including basic steel by 16,850 (-18.7%), fabricated metal products by 3,500 (-16.7%), railroad transportation by 1,750 (-17.4%), and food and kindred products by 1,570 (-14.7%).

All of the above suggests, among other things, a sharpening of the dichotomy between well-paying, mentally demanding types of employment that ordinarily require higher education or some specialized training and poorly paying routine types of jobs that can be performed with little education or training—a squeezing out of many well-rewarded, industrial occupations in what has been the middle income range and people moving upscale. Consequently, some restoration could be expected for the value placed on higher education as a means for qualifying for the better life. On the other hand, analysts have warned that society may experience increased incidence of disillusioning under-employment, of people unable to find remunerative work at the levels for which their education prepared them. Universities, therefore, will have an obligation to adapt their programs to the realities of career opportunities as well as to changes in the ability to afford access to higher education.

College and university training, however, is not perceived to end with the completion of a degree but rather to continue throughout an individual's career. Collaborations between professional associations, universities, and professional schools have expanded greatly over the past five years. Further, state licensing boards generally have become concerned with continuing education and maintenance of licensure. The concept of mandatory continuing education has gained momentum, and some professional associations are requiring it for membership renewal, while some state legislatures have passed laws designating the number of continuing education hours a person must take to maintain a license. Although mandatory continuing education will continue to be a debated issue, the notion that a person will grow as the profession changes will have an impact on the type and structure of programs offered by the University.

Enrollment Prospects

While career and continuing education opportunities will have an influence over the University's menu of instructional programs, enrollment factors will influence the size of the programs. Based on demographic trends, the University can expect smaller enrollments in the years immediately ahead. The decline may be as much as -14.9%, from 26,919 full-time equivalent enrollments in 1982 to 22,904 by 1989, and -23.2% by 1992 if demographic trends continue and if the University takes no action to intervene by attracting a larger share of the available pool of college-age students. A central objective of the University in the years ahead will be to hold the enrollment decline to a minimum, while at the same time meeting its affirmative action goals relative to increasing student access. To do so, the University must seek ways of increasing the pool of potential students for higher education. In addition, the percentage of the college-going high school graduates in the prime recruiting areas choosing the University must be maintained, and graduate/first professional programs need to attract a growing proportion of the available student pool. Table 2 summarizes the results of a demographic study of the enrollments for the University.

Undergraduate enrollments, which produce the major share of tuition income for institutional support have been historically generated from relatively local sources. For example, in 1982, 52.5% of the first-time, full-time freshmen at the Pittsburgh campus came from Allegheny County alone, 70.9% from Allegheny and its five contiguous counties, and only 8.2% from out-of-state. The University's undergraduate enrollment future, therefore, would seem to be inextricably linked to the demography and related factors of the

Table 2

Full-time Equivalent Actual and Projected Trend Enrollments
Fall Term, 1978 to Fall Term, 1992

	Actual							Projected Trend*									
	1978	1979	1980	1981	1982	1983	*	1984	1985	1986	1987	1988	1989	1990	1991	1992	Percent Change 1982 to 1992
Undergraduate																	
Pittsburgh	14,509	14,545	14,739	14,776	14,931	15,129	*	14,989	14,462	13,944	13,308	12,945	12,671	12,195	11,634	10,926	−27.8%
Bradford	669	708	763	787	840	854	*	892	860	840	806	797	814	865	804	763	−10.7%
Greensburg	681	683	866	894	917	1,061	*	945	928	888	856	841	831	973	912	859	−19.0%
Johnstown	2,534	2,587	2,673	2,692	2,746	2,830	*	2,546	2,422	2,305	2,249	2,236	2,231	2,583	2,451	2,324	−17.9%
Titusville	400	343	364	382	337	285	*	299	299	281	277	281	282	313	293	274	−3.9%
Graduate	5,469	5,526	5,532	5,575	5,470	5,525	*	5,227	5,148	5,077	4,832	4,604	4,429	4,347	4,334	4,472	−19.1%
First Professional	1,738	1,745	1,776	1,673	1,678	1,588	*	1,646	1,646	1,646	1,646	1,646	1,646	1,646	1,646	1,646	−3.7%
Total University	**26,064**	**26,053**	**26,713**	**26,779**	**26,919**	**27,272**	*	**26,544**	**25,758**	**24,982**	**23,975**	**23,350**	**22,904**	**22,240**	**21,434**	**20,661**	**−24.2%**

Source: Ten-Year Enrollment Projections, Information Document Number 14, Office of Institutional and Policy Studies, Office of Planning and Budget, December, 1983.

*The trends assume that the University will continue to attract the same proportion of the enrollment pool that the University attracted in 1983. These figures thus reflect directly the projected decline in the enrollment pool from which the University derives its students.

Commonwealth and particularly to the southwestern sector of it. According to the projected trends, undergraduate full-time equivalent enrollment at the Pittsburgh campus is expected to peak this fall term, 1984 at slightly under 15,000 and decline steadily to 12,871 by 1989 and to 10,926 by 1992, a decrease of 27.8%. Passive acceptance of demographic trends would mean a very substantial drop in undergraduate enrollments and in the tuition income they produce. This suggests that the University undertake carefully designed strategies to attract more undergraduates by more aggressive recruiting and new programs to meet the educational needs of a broader range of students and steps to increase student retention. Reasonable and attainable enrollment goals should be established for each program.

Since graduate and first professional students are derived from a broader geographic base, projections regarding enrollments are more tenuous. The full-time equivalent totals of the graduate programs have remained fairly stable over the past five years, and enrollments in the first professional programs have been capped because the number of qualified applicants exceeds the capacity to accommodate them. The projected trends for graduate full-time equivalent enrollments, however, show a decline from approximately 5,500 to 4,429 by 1989, a decrease of 19.1%. First professional enrollments are anticipated to remain constant over the period to fall 1992 at 1,646 full-time equivalent students.

Instructive in the consideration of the University's enrollment prospects are the enrollment trends by level for the schools over the past five years. Table 3 summarizes the fall term full-time equivalent enrollments by level for each school from 1979 to 1983. Full-time equivalent undergraduate enrollments in Library and Information Science have increased tremendously over the past five years—from 6 in fall term, 1979 to 194 in 1983. Growth has also occurred at the Bradford, Greensburg, and Johnstown campuses. Enrollments at the Titusville campus, however, continue to decline. Within Education, both undergraduate and graduate enrollments have declined, 10.0% and 20.2%, respectively, while in Social Work the decline of 50 full-time equivalent undergraduate students has been more than offset by the increase of 65 at the graduate level. Both undergraduate and graduate enrollments in Nursing have increased over the past five years. While these represent only a few highlights of the historical school enrollments, these trends will be a consideration in establishing the enrollment goals for the schools.

Table 3

Fall Term Full-time Equivalent Enrollment by Responsibility Center
1979 to 1983

	Fall Term 1979	Fall Term 1981	Fall Term 1983	Percent Change 1979 to 1983	Rate of Change 1979 to 1983
Business					
Graduate	564	647	647	14.7%	3.5%
Education					
Undergraduate	369	368	332	-10.0%	-2.6%
Graduate	1,433	1,260	1,144	-20.2	-5.5
Engineering					
Undergraduate	2,133	2,120	2,078	-2.6%	-0.7%
Graduate	459	559	576	25.5	5.8
Faculty of Arts and Sciences					
Undergraduate	7,273	7,315	7,752	6.6%	1.6%
Graduate	1,298	1,251	1,320	1.7	0.4
General Studies					
Undergraduate	3,154	3,221	3,211	1.8%	0.5%
Graduate[a]	33	28	23	-30.3	-8.6
Law					
First Professional	664	701	624	-6.0%	-1.5%
Library and Information Science					
Undergraduate	6	139	194	3,133.3%	138.5%
Graduate	292	357	328	12.3	2.9
Public and International Affairs					
Graduate	336	367	372	10.7%	2.6%
Social Work					
Undergraduate	163	125	93	-42.9%	-13.1%
Graduate	296	312	361	22.0	5.1
Dental Medicine					
Undergraduate	101	109	98	-3.0%	-0.8%
Graduate	49	38	30	-38.8	-11.5
First Professional	493	434	424	-14.0	-3.7
Health Related Professions					
Undergraduate	349	329	349	0.0%	0.0%
Graduate	108	130	97	-10.2	-2.6
Medicine					
Graduate	79	65	65	-17.7%	-4.8%
First Professional	547	538	540	-1.3	-0.3
Nursing					
Undergraduate	596	672	652	9.6%	2.3%
Graduate	165	186	193	17.0	4.0
Pharmacy					
Undergraduate	411	358	370	-10.0%	-2.6%
Graduate	26	33	40	53.9	11.4
Public Health					
Graduate	356	342	329	-7.6%	-2.0%
Bradford					
Undergraduate	708	787	854	20.6%	4.8%
Greensburg					
Undergraduate	683	894	1,061	55.3	11.6
Johnstown					
Undergraduate	2,567	2,692	2,830	10.3%	2.5%
Titusville					
Undergraduate	343	382	285	-16.9%	-4.5%
University Total					
Undergraduate	**18,855**	**19,531**	**20,159**	**6.9%**	**1.7%**
Graduate	**5,494**	**5,575**	**5,525**	**0.6**	**0.1**
First Professional	**1,704**	**1,673**	**1,588**	**-6.8**	**-1.7**
Total	**26,053**	**26,779**	**27,272**	**4.7%**	**1.1%**

[a] *Interschool Programs*

In developing a strategy for maintaining enrollment levels near current levels, the University must consider two basic questions. (1) Why is the number of high school graduates in Pennsylvania who go on to college so low relative to other states, and what can be done to increase it? If the percentage of college going students were to be increased to near the national average, enrollment decline projections might be mitigated considerably. This suggests that the University should increase its efforts to make the high school student more aware of opportunities at the University and insure the availability of programs to meet projected student demands. (2) What will happen to student financial aid programs? As a large-scale undergraduate and graduate teaching institution, the University has to be concerned with student financial aid trends. According to the College Board, student aid from all sources declined from the 1981 peak of $18.1 billion to $16.0 billion in 1984. Analysis of actual federal expenditures for fiscal year 1983 and estimated expenditures for fiscal year 1984 show that federal support for grants, loans, and College Work Study programs decreased 7.0% in one year, from $6.7 billion to $6.2 billion. Federal administration budget recommendations for fiscal year 1985 would increase the total amount of support to $6.5 billion (still 3.0% less than in fiscal year 1983) but would completely eliminate support for supplemental grants, state student incentive grants, and National Direct Student Loans. The President's student assistance programs, by providing only for Pell Grants, College Work Study, and the Guaranteed Student Loans, have emphasized self-help as the philosophy for student aid. Whether this philosophy will prevail in the political arena is uncertain, but should it move ahead, the consequences to higher education in general and the University specifically could significantly alter the future student body size and composition.

For the University, student aid expenses for the federal campus-based and Pell grant programs and for the University programs, including those supported by endowment or gifts, were $17.0 million in fiscal year 1983 and are conservatively budgeted at $15.5 million for fiscal year 1984. The fiscal year 1983 figure represents a decrease of 1.9% in total expenditures for scholarships and fellowships from fiscal year 1980. Table 4 summarizes selected student aid programs available for University students, including State and federal loan programs and the State grant program, which are not budgeted by the University. Increasingly, the State PHEAA grants and loans are being utilized as a primary external source for assistance, while the federal Pell grants and the National Direct Student Loan programs are decreasing. Endowments and gifts represent only a modest potential for increasing support of student aid. This suggests that the University continue to support increased funding for PHEAA.

Table 4

Selected Student Aid Programs for the University
FY 1980 to FY 1984

	Actual FY 1980	Actual FY 1982	Estimated FY 1984	Percent Change FY 1980 to FY 1984
External Sources				
State PHEAA Grants	$ 3,455,618	$ 3,827,985	$ 5,000,000	44.7%
State PHEAA Loans	20,382,832	34,307,103	26,500,000	30.0%
Pell Grants	7,037,889	5,875,410	6,168,719	-12.3%
Federal Supplement Grants	925,000	1,127,700	1,259,087	36.1%
National Direct Student Loan	3,403,377	2,143,938	2,965,605	-12.9%
College Work Study	2,000,000	1,239,924	1,574,053	-21.3%
University Programs and Sources				
UCEP	$ 672,914	$ 729,836	$ 650,000	-3.4%
Chancellor's Scholarships	108,433	169,381	210,000	93.7%
Special Engineering	116,033	144,109	100,000	-13.8%
Provost Scholarships	50,366	94,065	90,000	78.7%
New Careers	132,617	96,515	60,000	-54.8%
Athletic Scholarships[a]	638,306	567,639	518,000	-18.8%
University Share of NDSL	165,554	214,348	309,000	86.6%
Endowments	711,380	743,936	1,283,660	80.4%
Gifts	341,080	738,368	648,065	90.0%

[a] *Offset by generated income*

Research and Sponsored Programs Opportunities

As a primary University mission, the research and sponsored program functions distinguish the University from other sectors of the higher education community. Over the past decade, revenues from grants and contracts have increased approximately 70.0%, and in fiscal year 1984, income from grants and contracts, excluding Western Psychiatric Institute and Clinic (WPIC), is budgeted at about $60.8 million, or 17.7% of operating revenues. This increase has been the product of the research initiatives taken by the University over the past five years, as described previously.

The future for many research programs, however, is inexorably linked to the federal research funding priorities since about 80% of the University's research and sponsored program funds comes from federal governmental sources. Table 5 presents information on selected federal agencies relative to the President's federal fiscal year 1985 budget request. Generally, the administration's proposals provide for continued strong support of basic research and graduate student support, particularly in engineering, high-energy physics, nuclear physics, computer science, astronomy, and biotechnology, and policy analysts suggest that universities will continue to receive the bulk of these funds. Within the National Science Foundation, for example, the proposed increase would provide additional support for research equipment at universities and national laboratories; for engineering, mathematics and physical sciences, and computer science; and for the development of "cross-disciplinary" research centers at universities that would foster industrial and academic collaboration.

Table 5

Funding for Selected Federal Agencies and Programs (in thousands)

	Actual Fiscal Year 1983	Estimated Fiscal Year 1984	Percent Change FY 1983 to FY 1984	Requested Fiscal Year 1985	Percent Change FY 1983 to FY 1985
National Institutes of Health	$4,025,000	$4,477,000	11.2%	$4,566,000	13.4%
National Science Foundation					
Research	$1,061,300	$1,140,955	7.5%	$1,308,212	23.3%
Science and Engineering Education	30,000	75,000	150.0	75,700	152.3
Department of Energy					
General Science	$ 534,467	$ 641,000	19.9%	$ 746,105	39.6%
University Research	266,000	321,000	20.7	343,000	28.9
Environmental Protection Agency	$ 121,000	$ 139,200	15.0%	$ 163,437	35.1%
Health Professions Education	$ 166,000	$ 126,200	−24.0%	$ 93,000	−44.0%
Health Research and Training	$ 349,606	$ 398,494	14.0%	$ 376,231	7.6%
National Endowment for the Humanities	$ 130,247	$ 140,000	7.5%	$ 125,475	−3.7%

The University's recent expanded efforts in developing industrial partnerships will be closely aligned not only with these federal trends in research funding but also with the Commonwealth's priorities for economic development. The recently instituted Western Pennsylvania Advanced Technology. Center represents a partnership between the University and Carnegie-Mellon University, several corporations, and the Commonwealth through its Ben Franklin Partnership program and exemplifies the varied character of future research endeavors. The industrial sector will be a growing and important factor in the support of the University's research mission. Over the planning period, the University's research programs can be expected to take on this multi-sectored character, as well as a multidisciplinary focus. Sources of support for research will necessarily be varied.

Human Resources

The recruitment and retention of highly qualified faculty and staff requires that the University remain competitive with regard to personnel policies, compensation, and other benefits. The University remains committed to the policy of equal opportunity and will fully exercise the implementation of its affirmative action plan throughout the planning period. Competition for talented personnel from industry, government, and other universities can be expected to intensify as the economy improves. The University's growing dependence on technically-qualified faculty and staff as the result of new developments in computing and telecommunications will make it essential to attract and retain well-qualified personnel. The training and development of the University's human resources will become increasingly important over the planning period.

The University must investigate fully methods to improve the operating efficiencies of its programs. The workloads of both faculty and staff must be analyzed; course scheduling, including the frequency and number of courses offered and class size, must be examined critically. Actions must be implemented that will permit operating economies while maintaining or enhancing program quality. The advent of new technologies should also generate increased operating efficiencies. The use of new office automation technology, such as word processors and micro-computers in conjunction with electronic mail and filing, should increase productivity. This, coupled with projected decreases in enrollment, will reduce the requirements for faculty and staff in many areas of the University, and faculty and staff growth in numbers can be expected only in those areas where enrollments increase or external funding is obtained.

Ultimately, the University's academic reputation and success rests on the quality of its faculty and their contributions to the instructional, research, and service missions of the University. For the five-year period from fiscal years 1980 to 1984, the number of full-time faculty increased by 4.4% from 2,288 to 2,388, an increase of 100 faculty members. As shown in Table 6, virtually all of this growth is accounted for by an increase of 144 faculty in the School of Medicine. The largest decrease in the number of faculty (-34) occurred in the Faculty of Arts and Sciences. With the implementation of the revised tenure policy which permits tenure stream faculty to move into a non-tenure stream status, the University experienced an 8.1% decrease in tenure stream faculty and a 4.5% increase in non-tenure faculty between fiscal year 1983 and fiscal year 1984. Some faculty once in the tenure stream are now being reassigned to the non-tenure track, especially in the Health Sciences areas.

Table 6

Full-time Faculty by Responsibility Center FY 1980 to FY 1984 (September 30)

	FY 1980	FY 1982	FY 1984	Percent Change FY 1980 to FY 1984	Rate of Change FY 1980 to FY 1984
Provost					
Tenured	6	7	7	16.7%	3.9%
Tenure Stream	0	0	1	—	—
Non-Tenure	8	9	7	−12.5	−3.3
Total	14	16	15	7.1%	1.7%
Business					
Tenured	27	25	30	11.1%	2.7%
Tenure Stream	16	23	22	37.5	8.3
Non-Tenure	8	9	3	−62.5	−21.7
Total	51	57	55	7.8%	1.9%
Education					
Tenured	109	112	108	−0.9%	−0.2%
Tenure Stream	19	10	7	−63.2	−22.1
Non-Tenure	53	51	57	7.5	1.8
Total	181	173	172	−5.0%	−1.3%
Engineering					
Tenured	78	80	76	−2.6%	−0.6%
Tenure Stream	20	11	14	−30.0	−8.5
Non-Tenure	10	11	5	−50.0	−15.9
Total	108	102	95	−12.0%	−3.2%
Faculty of Arts and Sciences					
Tenured	391	407	403	3.1%	0.8%
Tenure Stream	129	105	75	−41.9	−12.7
Non-Tenure	87	77	95	9.2	2.2
Total	607	589	573	−5.6%	−1.4%
General Studies					
Non-Tenure	10	10	8	−20.0%	−5.4%
Law					
Tenured	16	21	21	31.3%	7.0%
Tenure Stream	12	7	6	−50.0	−15.9
Non-Tenure	10	5	8	−20.0	−5.4
Total	38	33	35	−7.9%	−2.0%
Library and Information Science					
Tenured	14	14	15	7.1%	1.7%
Tenure Stream	3	3	5	66.7	13.6
Non-Tenure	9	9	11	22.2	5.1
Total	26	26	31	19.2%	4.5%
Public and International Affairs					
Tenured	30	26	22	−26.7%	−7.5%
Tenure Stream	3	3	4	33.3	7.5
Non-Tenure	6	4	7	16.7	3.9
Total	39	33	33	−15.4%	−4.1%
Social Work					
Tenured	19	23	27	42.1%	9.2%
Tenure Stream	10	9	2	−80.0%	−33.1
Non-Tenure	4	5	4	0.0	0.0
Total	33	37	33	0.0%	0.0%
Senior V. C. Health Sciences					
Tenure Stream	1	0	0	−100.0%	−100.0%
Non-Tenure	12	13	13	8.3	2.0
Total	13	13	13	0.0%	0.0%
Dental Medicine					
Tenured	46	45	43	−6.5%	−1.7%
Tenure Stream	24	16	15	−37.5	−11.1
Non-Tenure	26	33	35	34.6	7.7
Total	96	94	93	−3.1%	−0.8%
Health Related Professions					
Tenured	13	14	17	30.8%	6.9%
Tenure Stream	6	3	5	−16.7	−4.5
Non-Tenure	13	13	13	0.0	0.0
Total	32	30	35	9.4%	2.3%
Medicine					
Tenured	154	157	166	7.8%	1.9%
Tenure Stream	160	206	203	26.9	6.1
Non-Tenure	238	283	327	37.4	8.3
Total	552	646	696	26.1%	6.0%
Nursing					
Tenured	20	19	20	0.0%	0.0%
Tenure Stream	46	36	20	−56.5	−18.8
Non-Tenure	34	41	48	41.2	9.0
Total	100	96	88	−12.0%	−3.1%
Pharmacy					
Tenured	16	16	19	18.8%	4.4%
Tenure Stream	14	14	7	−50.0	−15.9
Non-Tenure	3	7	9	200.0	31.6
Total	33	37	35	6.1%	1.5%
Public Health					
Tenured	29	27	27	−6.9%	−1.8%
Tenure Stream	3	0	13	333.3	44.3
Non-Tenure	41	48	26	−36.6	−10.8
Total	73	75	66	−9.6%	−2.5%

Table 6 continued

	FY 1980	FY 1982	FY 1984	Percent Change FY 1980 to FY 1984	Rate of Change FY 1980 to FY 1984
Bradford					
Tenured	16	16	21	31.3%	7.0%
Tenure Stream	21	23	13	-38.1	-11.3
Non-Tenure	11	12	17	54.5	11.5
Total	48	51	51	6.3%	1.5%
Greensburg					
Tenured	14	18	23	64.3%	13.2%
Tenure Stream	12	10	8	-33.3	-9.6
Non-Tenure	7	8	12	71.4	14.4
Total	33	36	43	30.3%	6.8%
Johnstown					
Tenured	63	72	70	11.1%	2.7%
Tenure Stream	40	36	39	-2.5	-0.6
Non-Tenure	23	25	32	39.1	8.6
Total	126	133	141	11.9%	2.9%
Titusville					
Tenured	8	7	6	-25.0%	-6.9%
Tenure Stream	0	3	3	0.0	0.0
Non-Tenure	5	3	2	-60.0	-20.5
Total	13	13	11	-15.4%	-4.1%
Learning Research and Development Center					
Tenured	5	6	5	0.0%	0.0%
Tenure Stream	0	0	1	—	—
Non-Tenure	5	4	1	-80.0	-33.1
Total	10	10	7	-30.0%	-8.5%
University Center for International Studies					
Tenured	1	0	1	0.0%	0.0%
Non-Tenure	1	3	3	200.0	31.6
Total	2	3	4	100.0%	18.9%
University Libraries					
Non-Tenure	47	43	55	17.0%	4.0%
Western Psychiatric Institute and Clinic					
Non-Tenure	3	5	0	-100.0%	-100.0%
University Total					
Tenured	1,075	1,112	1,127	4.8%	1.2%
Tenure Stream	539	517	463	-14.1	-3.7
Non-Tenure	674	731	798	18.4	4.3
Total	2,288	2,360	2,388	4.4%	1.1%

Research associates are another important resource of the University. In 1984, the 156 full-time research associate appointments were highly concentrated within the University: 56 in the natural sciences area of the Faculty of Arts and Sciences, 52 in the School of Medicine, 18 in the Learning Research and Development Center, 9 in the School of Engineering, 5 in the University Center for International Studies, and 16 in other areas.

University staff members perform a variety of essential functions in support of academic activities, including library, technical, research, computer, secretarial, and clerical services. Nonacademic institutional support services provided by the staff consist of administrative and management functions, budgeting and accounting, purchasing, communications, physical plant maintenance, planning, and security. Because these staff functions are so essential to University operations, the effectiveness of the staff also is related directly to the quality of the University. Over the five-year period from fiscal year 1980 to 1984, as shown in Table 7, the number of full-time staff has increased by 8.7% from 4,026 to 4,376, a total of 350. The number of part-time staff increased from 295 to 440, an increase of 145 employees or 49.2%. These increases are primarily associated with WPIC, involving increases of 284 full-time and 86 part-time staff which may be attributed to the large increase in externally funded research grants and contracts over the past five years. Similarly, the School of Medicine had an increase of 91 full-time and 10 part-time staff. The largest decreases in the number of full-time staff have occurred in the School of Education (-32), reflecting greatly decreased enrollment in that school; the Vice Chancellor for Business and Finance (-20), reflecting reductions in custodial staff; and the Learning Research and Development Center (-23), reflecting reduced research funding by the federal and State governments.

Table 7

Full- and Part-time Staff by Responsibility Center
FY 1980 to FY 1984
(September 30)

	FY 1980	FY 1982	FY 1984	Percent Change FY 1980 to FY 1984	Rate of Change FY 1980 to FY 1984
Chancellor's Office					
Full-time	29	18	21	-27.6%	-7.8%
Part-time	1	2	3	200.0	31.6
Administration					
Full-time	0	0	1	—	—
Business and Finance					
Full-time	826	798	806	-2.4%	-0.6%
Part-time	7	8	15	114.3	21.0
Auxiliary Enterprises					
Full-time	234	236	250	6.8%	1.7%
Part-time	9	8	7	-22.2	-6.1
Student Affairs					
Full-time	100	101	103	3.0%	0.7%
Part-time	3	5	6	100.0	18.9
Planning and Budget					
Full-time	35	34	36	2.9%	0.7%
Part-time	1	1	1	0.0	0.0
University Computer Center					
Full-time	101	100	110	8.9%	2.2%
Part-time	0	1	2	—	—
Athletics					
Full-time	62	68	66	6.5%	1.6%
Part-time	9	13	11	22.2	5.1
Public Affairs					
Full-time	90	93	101	12.2%	2.9%
Part-time	2	1	6	200.0	31.6
Secretary					
Full-time	19	18	18	-5.3%	-1.3%
Part-time	3	4	7	133.3	23.6
Provost					
Full-time	121	130	139	14.9%	3.5%
Part-time	14	12	13	-7.1	-1.8
Business					
Full-time	58	58	49	-15.5%	-4.1%
Part-time	4	5	6	50.0	10.7
Education					
Full-time	130	114	98	-24.6%	-6.8%
Part-time	5	11	12	140.0	24.5
Engineering					
Full-time	58	51	49	-15.5	-4.1%
Part-time	4	4	7	75.0	15.0
Faculty of Arts and Sciences					
Full-time	273	266	259	-5.1%	-1.3%
Part-time	39	41	41	5.1	1.3
General Studies					
Full-time	35	37	37	5.7%	1.4%
Part-time	3	4	4	33.3	7.5
Law					
Full-time	26	27	29	11.5%	2.8%
Part-time	0	5	4	—	—
Library and Information Science					
Full-time	14	13	22	57.1%	12.0%
Part-time	4	5	4	0.0	0.0
Public and International Affairs					
Full-time	36	28	20	-44.4%	-13.7%
Part-time	3	0	3	0.0	0.0
Social Work					
Full-time	16	13	17	6.3%	1.5%
Part-time	1	1	0	-100.0	-100.0
Senior Vice Chancellor, Health Services					
Full-time	45	55	52	15.6%	3.7%
Part-time	4	2	3	-25.0	-6.9
Dental Medicine					
Full-time	117	119	121	3.4%	0.8%
Part-time	14	12	12	-14.3	-3.8
Health Related Professions					
Full-time	19	15	17	-10.5%	-2.7%
Part-time	4	2	0	-100.0	-100.0
Medicine					
Full-time	308	392	399	29.5%	6.7%
Part-time	22	25	32	45.5	9.8
Nursing					
Full-time	35	30	27	-22.9%	-6.3%
Part-time	1	0	3	200.0	31.6
Pharmacy					
Full-time	16	21	18	12.5%	3.0%
Part-time	3	2	2	-33.3	-9.6
Public Health					
Full-time	123	141	117	-4.9%	-1.2%
Part-time	19	18	16	-15.8	-4.2
Bradford					
Full-time	45	56	55	22.2%	5.1%
Part-time	2	7	4	100.0	18.9
Greensburg					
Full-time	16	21	28	75.0%	15.0%
Part-time	3	4	4	33.3	7.5
Johnstown					
Full-time	138	150	150	8.7%	2.1%
Part-time	5	5	10	100.0	18.9
Titusville					
Full-time	22	19	22	0.0%	0.0%
Part-time	3	7	6	100.0	18.9
Admissions and Student Aid					
Full-time	47	45	50	6.4%	1.6%
Part-time	2	1	2	0.0	0.0

Table 7 continued

	FY 1980	FY 1982	FY 1984	Percent Change FY 1980 to FY 1984	Rate of Change FY 1980 to FY 1984
University Libraries					
Full-time	125	117	127	1.6%	0.4%
Part-time	7	4	9	28.6	6.5
Learning Research and Development Center					
Full-time	85	67	62	−27.1%	−7.6%
Part-time	6	5	11	83.3	16.4
University Center for International Studies					
Full-time	30	17	22	−26.7%	−7.5%
Part-time	7	3	5	−28.6	−8.1
Social and Urban Research					
Full-time	6	7	8	33.3%	7.5%
Part-time	1	1	1	0.0	0.0
Western Psychiatric					
Full-time	586	644	870	48.5%	10.4%
Part-time	80	112	168	110.0	20.4
University Total					
Full-time	4,028	4,119	4,378	8.7%	2.1%
Part-time	295	341	440	49.2	10.5

Financial Prospects

Revenues. Changes in University revenues during the coming years are largely a matter of conjecture, since a substantial share of total revenues come from the State appropriation and the federal government over which the University has no control. Some estimates of the University's future financial picture have been developed, however, based on past trends and certain assumptions. In fiscal year 1984, tuition contributed about 29.3% of the University's operating revenues, totaling $100.7 million. While in the past decade increases in tuition rates accounted for most increases in tuition revenue, future fluctuations in revenues from tuition are expected to be primarily a function of enrollment trends. The projected decline in enrollment, if it occurs, would have a serious negative impact on tuition revenues. Future tuition revenues also will be sensitive to changes in student aid policies at the State or federal level. If tuition rates and student aid are assumed to be constant, revenues from tuition would be expected to decline by as much as $17.5 million over the next decade as a result of projected enrollment decreases. Clearly, such a decline would have a devastating impact on University finances. Of central importance, therefore, is to take action to reduce the severity of projected enrollment declines by improved recruitment and retention programs and provision of academic programs in areas of growing demand.

Since becoming a Commonwealth University in 1966, the University and WPIC have consistently received financial support from direct State appropriations. In fiscal year 1984 these appropriations accounted for 25.5% of the operating revenues, totaling $87.3 million. Within a national context, however, Pennsylvania consistently has ranked low in its support of postsecondary education, although it ranks high in terms of its capacity to provide such support. During the last ten years, the Commonwealth appropriation to the University has increased at an average rate of seven percent per year, and over the past five years, at a rate of five percent per year. During the same period, inflation increased by 118.4%, so that in constant 1974 dollars, the value of the State appropriation actually declined by $10.6 million, or 22.2%. Given this history of the Commonwealth's support to postsecondary education, the University can expect a rate of increase roughly equivalent to the rate of inflation if inflation remains below ten percent through fiscal year 1990, assuming no change in the legislative process or funding priorities. If inflation increases beyond that, the State appropriation is not expected to increase by more than ten percent.

Grants and contracts derived from the federal, State, and local governments and from private sources, such as companies or individuals, for the support of specific activities, including sponsored research and sponsored programs, have increased approximately 70.0% in the past decade. In fiscal year 1984, income from grants and contracts is budgeted at about $68.5 million, or 19.9% of operating revenues. Since the Office of Research does not project a continued growth in grants and contracts, revenues are anticipated to remain at a constant level over the planning period.

Income earned on the endowment funds and private gifts to the University which is applied to the operating expenses of the institution comprises a relatively small, but important, source of funds. In fiscal year 1984, budgeted income from this source amounted to $8.3 million, about 2.4% of total revenues. The amount of endowment funds available for application to the operating expenses is naturally a function of the earnings of the University endowment, which had a June 30, 1983 market value of approximately $140.0 million. The extent that inflation and new tax regulations have adversely influenced the pattern of applied endowment earnings and gifts to the University over the past decade provides the basis for projecting this revenue source. Conservative trends indicate that current income from private gifts can be expected to stabilize at the fiscal year 1984 level of about $2.8 million (adjusted for inflation), while income from existing endowment funds can be expected to increase at approximately 4.0% per year.

Sales and services of WPIC have increased significantly over the last ten years. In fiscal year 1974 revenues from patient care totalled $4.6 million, while in the current budgeted year revenues will total $31.2 million, an increase of about 578%. It is anticipated that the rate of increase in revenues from WPIC will moderate slightly, yet still grow at approximately 20.0% per year. Since WPIC is self-supporting, these revenues are not available for redistribution.

Monies received from charges for educational and clinical services provided by medical and dental faculties, Falk School, and the University Press and income from interest on short-term investments, miscellaneous rental revenues, and other minor source income were budgeted at about $15.0 million in fiscal year 1984, accounting for 4.4% of total operating revenues. Mostly external factors beyond the University's control affect these revenues, and no real growth is forecast.

Auxiliary enterprises (dormitory fees, board charges, parking fees, receipts from athletic events, college bookstore receipts, and so on) are expected to generate about $32.1 million in fiscal year 1984, or 9.4% of total revenues. Revenues from auxiliary enterprises, which support their own activities and are not available for redistribution to other areas, are expected to remain stable, unless increasing costs of operations drive up their prices.

Expenditures. In addition to projections of revenues, specific items of expenditures should be incorporated into the University financial planning. During the last nine years, mandated increases for utilities, contracts, and fringe benefits, such as social security, have been increasing above the rate of inflation and can be expected to do so in the future. Compensation, which has been increasing below the rate of inflation, is a high priority and is planned to increase above the rate of inflation over the planning period. Major deferred maintenance on buildings will need to be provided at an increasing level, and a pool of $3.0 million will be necessary to fund this expense. Further, the University has issued through the Allegheny County's Higher Education Building Authority approximately $38 million of bonds which will mature in 2013. The effect on current operating funds will be approximately $6.8 million per year, of which $3.4 million represent non-auxiliary debt. This amount is currently being funded annually and will remain constant over the planning period.

The "Campus of the Future" project, which will upgrade the existing telecommunications, administrative, academic, and library information systems, will require extensive resources for both debt service costs and annual maintenance costs. As a result of compliance with OMB Circular A-21, during fiscal year 1985, the University will implement changes concerning the charging for computer use and the accounting for graduate student tuition remission which are expected to result in increased costs and lower revenues amounting to $3.0 to $4.0 million annually and to remain constant over the planning period.

Finally, new academic and administrative programming, as well as a portion of increased inflationary costs, has been financed by more efficient use of existing resources, increased productivity, and internal reallocation. During the past nine years, approximately $25 million has been reallocated internally. The University currently has a contingency reserve of $1.0 million to cover unanticipated expenditures during a fiscal year, which represents approximately 0.3% of the University's operating budget. Over the next nine-year period, a reasonable goal is to increase this reserve to $3.5 million, or 1.0% of the operating budget.

Summary. During the planning period, tuition and the Commonwealth appropriation are expected to continue to provide the major portion of the University revenues. Other revenues are anticipated to remain constant or to decline as a percentage of total revenues. Total revenues are not expected to increase at a rate that exceeds inflation. Expenditures, during this period, however, are expected to grow at a rate greater than inflation to provide increased funding for salaries, to meet externally mandated increases for costs of social security, unemployment compensation, and insurance, to pay for building maintenance and utilities, and to pay for advanced computing and telecommunications equipment. If expenses grow at a rate that exceeds inflation, such growth must be financed through more efficient use of existing resources, increased productivity, new sources of funding, and internal reallocation of financial and human resources.

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OFFICE OF MANAGEMENT STUDIES

ASSOCIATION OF RESEARCH LIBRARIES 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036 • (202) 232-8656

ORGANIZATIONAL PROJECTIONS FOR ASSESSING FUTURE RESEARCH LIBRARY STAFFING NEEDS AND PROSPECTS

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INTRODUCTION

The intent of these organizational projections is to provide distinct options in which to assess staffing needs and possibilities for research libraries in the next decade. Each option is derived from speculations about how universities and their libraries will embrace technological and other environmental developments. For the most part, the descriptions are not specific in order to allow a wide ranging examination of library prospects. The following assumptions were made in the construction of these options:

- While larger research libraries are the target of discussion, organizational agility and responsiveness to pressures will be based on size, tradition, scope and nature of academic programs, governance patterns, and relationships to external systems.
- The view taken for discussion purposes is system-wide and administrative, recognizing that particular components of the organization and various clientele groups may view the same issues quite differently.
- The time frame is ten years to allow the patterns identified to emerge as operating differently.
- While a composite option may be derived from the four choices presented, it is hoped that the descriptions illustrate issues and lead to consideration of initiatives needed to achieve a preferred future.
- All options involve certain basic concerns such as an estimate of financial prospects, cooperative programs, philosophy and value systems, technology, internal resource allocation and share of the financial resources of the university, relationships with primary client groups, and the integration of historical tools and resources into the emerging organization.

OPTION ONE

DEFINITION: This center provides traditional physical and bibliographic access to published knowledge, employing some automated techniques to achieve needed economies. Primary sources are hard copy documents, with computerized bibliographic control provided for most collections owned. Telecommunication is used to provide supplementary access to required data files. Commercial automated information services are available on a fee basis. Full public services are provided on an on-demand basis responding to specific requests for assistance, especially in the use of the collection and the facility. The card catalog is closed but limited retrospective conversion prevents a fully functioning on-line catalog. Staff are general purpose librarians with a fair amount of functional specialization.

UNIVERSITY CONTEXT: The university takes a cautious approach to introducing and using technological innovations. Faculty departments operate autonomously with little need or desire to coordinate with other units. University planning is largely incremental rather than strategic. Fiscal constraints and other issues lead to a philosophy of "wait and see" rather than one of innovation or experimentation. The university treats information related functions in a laissez-faire fashion wth the computer center, the academic departments, and the library pursuing specialized and competing agendas. Assessment of the library focuses more on the size and scope of the collections than on the quality and effectiveness of information delivery.

PHILOSOPHY AND ROLE: The success of the library is measured by university administrators in terms of controlling costs and minimizing complaints. Maintaining needed levels of acquisitions is the faculty view of success. Ownership rather than access to required documents is viewed as the ideal. Faculty occasionally use commercial and professional data bases to secure needed documents directly from authors or commercial document delivery agencies. The library is viewed as a general resource for instruction and student work. The faculty rely on the research level collections for support in their subject specialties. Self-directed access to the library facility and resources is viewed as a traditional and cost effective way of obtaining and using information and materials.

STRATEGIC CONCERNS:

1. Maintaining current functions and mission within a series of budget reductions and expansions.

2. Securing the required percentage of published literature in the face of continuing inflation and a growing volume and array of materials.

3. Assessing and installing tested technology that is affordable and meets performance requirements.

4. Maintaining a competent staff committed to the delivery of traditional library services.

5. Securing an increasing proportion of the university's operating budget to contend with inflation.

6. Entering into and strengthening cooperative arrangements in order to address problems that require resources beyond the financial capacity of the individual university.

STAFFING ISSUES:

1. Staff size: This is a labor-intensive and book-oriented library requiring major allocations for acquisitions and staff. The 1984 median pattern of ARL member allocation of 35% for collections, 55% for staff, and 10% for other (this includes network charges, telecommunication costs, supplies, equipment and computer maintenance charges) will not be altered drastically.

2. Staff composition: Since this calls for the same type of people to do roughly the same work as today, the composition of the staff can be examined by assessing demographics. There will be more younger people in our libraries as the baby boomers fill slots. Seventy percent of the staff will be under 40 years of age. Forty-seven precent will have 10 years of experience or less. Traditional avenues of advancement will be limited and a large bulk of staff will reside at entry or junior level positions.

3. Staff skills and qualities: This option may not attract or keep the best people because of the relatively low level of innovation and experimentation, limited career advancement opportunities, and strong pressure to work longer and harder without significant pay increases.

4. Staff organization and classification: A functional organization encompassing reader services, technical services, collection management, and administration will continue to be the prevalent structure. Classification for staff will become more rigid and specified due to a variety of factors including decreased turnover, growth of collection bargaining, etc.

5. Staff training and development: Library interest in upgrading staff skills and improving staff performance leads to more investment in training although the character of this training continues to be episodic and responsive to short-term needs. There is no specific budget for training.

OPTION TWO

DEFINITION: The library continues to center around the traditional functions of acquiring, housing, organizing, and making available printed resources that support the instructional and research missions of the university. The library has automated most functions and provides on-line bibliographic access to its collections as well as to most of the nation's published literature. On-line information services are provided for most subjects emphasized by the university. In addition, the library has assumed an information transfer role wherever it is available (extensive use is made of formal network and consortia arrangements) and providing this information to users regardless of academic status. Information services are emphasized and aggressive outreach programs such as end user searching and information management education are operated. The library staff has a number of specialists with most librarians operating with multiple responsibilities that cut across the traditional functions. Networks and cooperative arrangements are used extensively to provide backup support and achieve savings in bibliographic control and access to needed materials. The card catalog has been closed and retrospective conversion completed.

UNIVERSITY CONTEXT: There is a visible commitment to extend and enhance the information capability of the university through the encouragement of practical technological innovation. The driving forces are economics, strong and extensive investment in traditional means (especially the library), and the availability of affordable, useful automation. While cost control is a prominent concern, there has been an effort to plan comprehensively and strategically, particularly in light of the changing demographics of students, the new emphasis on the use of information, and the need to compete with other institutions of higher education. The extent of change in university curriculum and scholarly practices is, however, limited by some lethargy and anxiety among the faculty, particularly in the traditionally strong departments. There are increasing numbers of faculty enthusiastic about the potential of technology.

PHILOSOPHY AND ROLE: Success of the library is viewed primarily in terms of growth in collections, relative status among higher education institutions, and reputation for responsiveness to campus interests. The notion of access to information resources is promoted and there is a deliberate library management strategy of focusing on user needs and striving to satisfy those needs. The library provides newer technologically-based services as a supplement to traditional library activities.

STRATEGIC CONCERNS:

1. Most of the concerns noted in the first option apply here as well. Since this is a less stable model there are added leadership challenges for introducing and managing change, including maintaining parallel systems.

2. Reorganization of staff in a low-turnover environment to make greater use of skills and experience while employing technology to improve productivity in performing the traditional functions.

3. Improving supervisory and management practices with a growing concern for improved individual performance and output.

4. Entering into and strengthening cooperative arrangements in order to meet the problems of inflation, preservation of deteriorating collections, and efficient production of bibliographic records.

5. Developing better understanding of users, especially faculty information needs and use patterns.

6. Budgeting for the provision of new technologically based services provided as a supplement for traditional services.

STAFFING ISSUES:

1. Staff size: This option calls for an increasing proportion of the library's budget to be allocated to the "other" category, i.e. network charges, telecommunication charges, computer maintenance charges, and miscellaneous expenses -- possibly as much as 15 to 20%. As a result, some reduction in acquisitions or staff will be required. Because libraries are experiencing significant reduction in purchasing power for printed materials, it seems unlikely that shifting funds from this category will be acceptable. Therefore some reduction in staff as well as a shift in responsibilities is called for in this model. The internal allocation of resources might follow a pattern for 35% for acquisitions, 50% for staff, and 15% for other.

2. Staff composition: Among the shifts occurring will be a movement of staff from technical to public services. The demographic trends described in Option One will apply here also. The overall structure will be more flexible and fluid than Option One.

3. Staff skills and qualities: This option calls for a staff that is at ease with technology but possessing solid traditional skills. A greater demand will be placed on those who have verbal communication skills, work well in group settings, write clearly and easily, and are quite flexible and adaptable in dealing with changing assignments and multiple reporting relationships.

4. Staff organization and classification: A flatter organization seems likely with project groups used as a primary means for solving problems and delivering services. While this can lead to increased staff participation and job satisfaction, it may reduce traditional promotion opportunities.

5. Staff training and development: The added capabilities and greater flexibility characteristic of the option result in a larger investment in staff training. There is comprehensive planning and ongoing attention to the development of individual skills and contributions. There will be a significant budget allocation for this purpose and a major senior level position with responsibilities for training and development.

OPTION THREE

DEFINITION: The library evolves to a series of sophisticated discipline-oriented information services modeled after the medical field where national and regional services provide the infrastructure for local agencies to provide timely, user-tailored information support. Such service is available in the humanistic and historical studies, social sciences, physical sciences, biological sciences, and the prominent professional schools through decentralized, institutionalized information units. Public services vary according to the characteristics and needs of the discipline but tend to be personalized and intense, relying extensively on technology for access to required information. The staff consists mainly of subject specialists with many of the traditional functions of acquiring and cataloging of published literature achieved through commercial and network services. A central library capability exists to operate certain basis instructional support functions, provide document delivery services from the remote storage and central collection, and maintain communication and coordination among local information services and the regional, national, and international agencies relied upon for information access and retrieval.

UNIVERSITY CONTEXT: There is increasing specialization in the research arena, with institutions securing private and federal support to establish cooperative centers that address societal concerns on an interdisciplinary basis. These centers are closely related to the redirection of university organization to emphasize and facilitate the way scholars work together. The use of affinity groups for organizing disciplines becomes stronger. In addition, there are special purpose educational institutions both within the traditional not-for-profit domain as well as other settings, where educational programs are operated by major corporations. As a result, the familiar university centralized structure is modified, with more budget and program control extended to colleges and smaller units.

PHILOSOPHY AND ROLE: There is a great deal of diversity in the definition of the university's information services with success of these services tied to the work of scholars in the discipline or the interdisciplinary centers. As a result, the science information services are measured on the basis of speed, responsiveness, and relevance. The humanistic and historical studies information support is evaluated in terms of breadth, richness, and variety. The driving goal is meeting the specialized needs of scholars via access to a variety of local, regional, and national services that are maintained and operated on campus for the benefits of local users.

STRATEGIC CONCERNS:

1. Organization and use of information in the disciplines and the relationships among the different centers.

2. Securing the subject oriented staff to provide the information services required and integrating them into the research library environment in a period of low staff turnover.

3. Developing and maintaining relationships with faculty in the disciplines, particularly in regard to librarians working as part of the institutional or research project team.

4. Maintaining and strengthening the relationships with national services and agencies particularly with regard to the national information infrastructure that needs to be created in some instances.

5. Budgeting for and funding the costs associated with network and technology based information services.

6. Securing the risk capital to convert to this form of decentralized information service.

7. Acquainting specialized faculty with the broad range of information and information services available outside of their specialty.

STAFFING ISSUES:

1. Staff size: The substantial investment in technology and network services along with the reliance on subject specialists will argue for reallocation of funds from acquisitions to the other categories while maintaining the labor intensive character of current operations. The division of funds may be 25% for acquisitions, 55% for staff, and 20% for other. Some additional short-term funding may be needed to manage required turnovers in staff during a period which is not conducive to turnover.

2. Staff composition: A shift from functional specialists to subject specialists will be highlighted. The support staff will be management and computer specialists. There would be relatively low levels of acquisitions, and thus technical services staff would be greatly reduced.

3. Staff skills and qualities: In this option the subject credentials are assumed and the parallel concerns of personality characteristics such as confidence, energy level, and ability to influence become prominent. There are also significant requirements to work well in group settings and to manage time and set priorities independently.

4. Staff organization and classification: This option calls for a variety or organizational structures depending on the requirements of the discipline being supported. The coordination of these information outposts will be a concern but there should be some effort to move staff among units to ensure the interdisciplinary perspective. Smaller support staffs and the reliance on the subject specialist may lead to less concern directed toward classification structures and greater opportunities for job enrichment and growth.

5. Staff training and development: There may be less need for a major retraining effort in this option since the focus is on getting people with a different set of credentials. The development needs in this option will be oriented more toward keeping abreast of technological and discipline advancements.

OPTION FOUR

DEFINITION: Campus coordination for the production, dissemination, and use of scholarly and administrative information is centralized in a highly automated Academic Information Center. University planning councils advise the center which has the responsibility for policy making, research, operations, funding, and strategic planning for all aspects of academic information use including instruction, research, personnel, financial, curriculum, and student records. Traditional functions included within the center are computer, library, telecommunications, publishing, and media services. There is a university vice president in charge of the information function. Information services are equipment-based and highly interactive, with users effectively designing information strategies to solve their research and instructional problems. The primary mode of operation is end user searching of data bases without personal assistance. Center staff are largely technical and managerial specialists with a few general purpose information staff. Document storage and bibliographic control functions are maintained by national agencies. Access and delivery services are coordinated by the Academic Information Center.

UNIVERSITY CONTEXT: Education is largely indivdualized, with scholars receiving most of their information through electronic media. Researchers may work easily in interuniversity research projects irrespective of geographical or organizational location. Students rely on satellite mediated long-distance communication systems to allow two-way audiovisual and digital conferences, selecting course offerings from a variety of agencies. The university as an organization is quite centralized, coordinating the flow of information to provide the essential services scholars and students require on a decentralized basis. The information center may be operated on a regional or state-wide basis with a traditional library maintained as an archival node in the network.

PHILOSOPHY AND ROLE: Ready access to information regardless of type, source, location, or format is the mission of the Academic Information Center. Work includes development of knowledge bases (automated encyclopedias), deployment of technology, and system design. Success will be determined by the achievement of economies of scale as well as by the provision of sophisticated new information capabilities. With increasing use of personal computers, document delivery, and data banks, the traditional service role is taken over by the end user with the information center staff serving as brokers among utilities and users. Training in use of information in the disciplines is either assumed by the teaching faculty or is accomplished through machine based methods.

STRATEGIC CONCERNS:

1. The risk capital required to establish such a capability.

2. User reaction to depersonalized services.

3. Disposal of a large cadre of traditionally trained librarians.

4. Defining and maintaining working collections for faculty whose interest in books and journals does not diminish. This may involve shaping faculty attitudes.

5. The role and impact of artificial intelligence on the use of information.

6. The progress toward this option that can be achieved within as short a time span as ten years.

7. Achieving operating economies promised by declining costs of computer hardware, software, and storage.

8. Defining what a library is in a technologically sophisticated environment.

STAFFING ISSUES:

1. Staff size: This model suggests a reversal of present allocation practices wth more spent on the "other" category than on acquisitions, e.g. 15% collections, 45% staff, and 40% for technology based costs. While staff size may be greatly reduced, staff costs may remain high because of the type of technical and management staff needed and because the overall costs of the operation may be less.

2. Staff composition: While there may be some service staff to mediate the exchange among users and information sources, the emphasis in this model is on machine-based services. As a result, the information center requires management and technical specialists both for operation and delivery functions.

3. Staff skills and qualities: There are few non-skilled jobs in this option. Because information is accessed directly by users via machines, the primary staff skills are technologically oriented.

4. Staff organization and classification: This option calls for a more rigid organization, highly centralized and dependent on the technology from which it derives its basis mode of operation.

5. Staff training and development: Staff will be expected to keep up-to-date on technological developments through reading, special institutes, etc.

DISCUSSION QUESTIONS:

1. What factors in the university situation are most influencial in moving toward this option?

2. Is this option feasible or likely for your library?

3. Is this a preferred future for your library?

4. What needs to be done to prepare now for this future?

SEPTEMBER 1983

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

THE LIBRARY IN FIVE YEARS

Reference and Research Services

The expanded facilities of the new Davis Library and the increasing use of new technology will greatly improve the library's capability to provide reference services in support of the research and instructional programs of the University. The Business Administration/ Social Sciences Reference Department and the Humanities Reference Department will occupy 28,500 square feet in the Davis Library compared with approximately 18,000 square feet occupied in Wilson. The Serials Reading Room in the new library is 5,800 square feet compared to 3,800 square feet in Wilson. There will be ample seating in these areas, and the space has been scientifically designed, lighted, and furnished to provide optimum conditions for work and study.

It is anticipated that the reference staffs will experience increasing demands for reference assistance, caused partly by the growth in use normally experienced when a new library opens, partly by the burgeoning availability of information in all forms, and partly by the use of the new technologies. The growth in demand for online bibliographic searches, Library and Research Consultations, term paper clinics, bibliographic instruction and tours, is expected to continue, perhaps necessitating adjustments in staffing. The reference departments will expand their publicity efforts to make sure that every faculty member and student knows his or her way around the library and can find the services with which they are familiar. In order to assure that all faculty and students are aware of all available services and the depth of the resources in our collections, written publicity and instruction in the use of facilities and resources may increase. In this effort, the reference departments also will use overhead projectors and video cassette players to increase the effectiveness of bibliographic instruction classes, and the Media Center will be asked to assist the Library in developing programs for the use of these tools.

The departmental libraries will continue to make available both traditional and online reference services. By 1988 all science libraries should have terminals that will allow them to search databases available online. Couch, Brauer, Kenan, and Geology already offer this service. Zoology will soon follow. The Art, Music, Library Science, Chapin, and Institute of Government libraries all answer reference questions in their subject areas for the entire campus, and they will continue to do so. They will probably rely on the main library reference departments for online searching, at least for the near future.

The Undergraduate Library does a large amount of reference work and conducts an extensive program of bibliographic instruction for undergraduate students. This program ranges from tours of the library to personalized Term Paper Clinics. All departmental libraries work closely with BA/SS and Humanities on the location and verification of material for interlibrary loan. Reference questions appropriate to the subjects of the collections of the departmental libraries are referred there as a matter of course. Many questions require the use of reference materials from various locations, and on those, the staffs of the various branches and departments work together. This will continue to be the case, to avoid unnecessary duplication of reference works, to take advantage of the subject collections, and to use the reference skills of all librarians to the greatest effect.

New formats, available to some degree now, will continue to be more evident. Computer generated indexes and concordances will increase the number of reference tools available, making accessible a level of detail that was unimaginable before the computer. Data files may be considered a legitimate part of library collections by 1988. For example, the Institute for Research in the Social Sciences currently purchases computer tapes of the U.S. Census. Access to these files by the Library would greatly enhance their utility, but the increasing demand for on campus data files will require additional coordination of services. The growing microcomputer industry is developing software packages for library applications, and the reference department of the future may feature an information system that includes online ready-reference databases. Automating the reference department in this manner will require a continuing budgetary commitment. In addition to the original outlays for equipment, funds must be available for maintenance, upgrading of equipment as technology develops, new software programs, and computer supplies.

There will be a wider range of reference tools available on microfilm and microfiche. There may be greater cooperation in the acquisition of reference tools, emphasizing the special areas of collection of each of the Triangle Area research libraries. This may mean the development of reference agreements for quick reference services by telephone between libraries. As more businesses move into the Triangle, they undoubtedly will make heavier use of BA/SS services and online searching facilities, and staff. There also may be increased demands on the reference departments by these businesses and other institutions for verification and location of titles in connection with interlibrary loan requests.

Most likely, there will be Triangle Research Library Network (TRLN) online catalog terminals available in the reference departments within five years. These will complement the locatinal tools already available, helping users locate books at UNC, Duke or North Carolina State. One of the biggest changes in the function of the reference departments will be the instruction of users in the use of the online catalog and union catalog. In addition, there may be SOLINET or OCLC terminals available in the reference departments. (The Southeastern Library Network, SOLINET, provides the Library with access to the automated cataloging system of the Online Computer Library Center, OCLC.) The extent of such equipment depends, of course, on the availability of funds.

There is expected to be an increased awareness and use of online searching by faculty, students, and other users. The speed with which an index can be searched online has made it cost-effective to verify citations in this manner. In addition, more and more "information" databases (as opposed to "bibliographic" databases) are being mounted, allowing much greater sophistication of use. (Some examples of this category are The Foundation Directory, Dun & Bradstreet's Million Dollar Directory, and Books in Print.) Another type of "information" database which is expected to grow is the "full-text" database. For example, full text of the New York Times and magazines such as Newsweek and U. S. News and World Report now are available through Mead Data's NEXIS system. Additionally, there are many "electronic" newsletters which are available only online, for example, through NEWSNET. More than likely, the Library will begin to access some of these types of databases during the next five-year period. The commercial vendors continue to offer new databases so that there are now more than 100 databases available to the library staff for searching. As reference staff continue to gain searching expertise and the number and diversity of databases increase, this approach to finding information will be used more and more. However, the extent to which hard copy indexes are replaced by computerized databases will be dependent upon how much computer searching is available on nights and weekends and what will be most cost effective for the user.

Since its inception as a service of the Library in 1975, online searching has grown dramatically. For example, in the Business Administration/Social Sciences Reference Department alone, 35 searches were performed in that initial year. By fiscal year 1982/1983, that number had increased to 1,207. This phenomenal rate of growth is expected to continue over the next few years. The majority-of users of online services have been staff, faculty, and graduate students. This user pattern is not likely to change as the cost of the service will continue to prohibit most undergraduates from taking advantage of it. However, there has been an increasing use of the service by area businessmen, and this trend is expected to continue.

The cost of searching many databases is expected to increase substantially as database producers/publishers attempt to compensate for the decreasing numbers of new subscriptions to their printed sources which they often perceive as a direct result of computerization. For example, the American Psychological Association recently increased the online royalty charges for their database, Psychological Abstracts, from 5¢ to 30¢ per citation. The substitution of online searching for the printed equivalents of the various indexes and abstracts has been a concern here at the UMC. However, the reference departments and the departmental libraries do not currently plan to cancel subscriptions to printed versions of sources just because they are available online. The narrow availability of online searching, limited as it is by cost and by time of day, is a major deterrent. In most cases, the printed, permanent copy is considered necessary.

The reference departments have recently acquired a new, high-speed terminal which prints at 120 characters-per-second (as opposed to the 30 characters-per-second terminal that had been used heretofore). This terminal should relieve some of the pressure on staff time. The new terminal also will improve the quality of the service by allowing more online printing when timeliness of results is a factor. The reference departments will share three terminal rooms in Davis, as compared to one in Wilson. Before 1988, the reference departments may acquire microcomputers which can be used to enhance online searching. This increase in the use of computer technology will require additional funding not only for the initial outlay for equipment purchase but for the related costs of maintenance services, telephone charges, and other operating expenses.

An additional function of the reference staff may be to train new "end users." That is, as faculty members and departments acquire their own terminals or personal computers and express a desire to search databases themselves, librarians' assistance may be sought to train them in technique and file structure. It is possible that some of these people, in developing their own databases, may train themselves and may choose to bypass the Library for certain information needs. This trend is not expected, however, to have a measurable impact on the Library.

The aforementioned technological changes imply redefining the role of the reference librarian. In the past, it was often the function of the reference department to help people locate information. More and more, the reference librarian is expected to be a direct PROVIDER of the information itself. Assistance will continue to be available, of course, for those people who choose to look for information themselves. Another aspect of this redefinition involves the librarian's role as teacher. Traditionally, the reference librarian has provided formal and informal bibliographic instruction on the use of materials. This role has encouraged users to seek out the librarian for instruction in the new technology. It may be that the ultimate role of the librarian will be to develop the sophisticated search strategy and then to let the user make the search. Again, microcomputers can be used as library instruction aids. The Undergraduate Library has already begun development of programs to help with library instruction of various types.

Moreover, increasing applications of technology lead directly to increased demands for services. For example, as users have grown to accept online searching, more of the reference staff's time has been spent preparing, performing, and explaining those searches; keeping abreast of new databases and search capabilities; and acquiring materials cited in the search. However, as the professional staff spends more of its time working in this area, the need for traditional reference services does not decrease; indeed, it continues to grow. Thus, more staffing is needed to maintain all levels of service.

The automation of reference services (the "computerization of the reference department") raises many new administrative and budgetary problems which must be resolved in the coming years, and the solutions to those problems will impact on library policies. One of the most fundamental budgetary problems involves the basic concept of the library as a source of free information for its community. Because budgetary support has not kept pace with the availability and demand for computerized search services, most libraries charge for their searches or the actual cost of accessing the database plus any hard copy printout. Although most searches are reasonably inexpensive, access to these resources is largely limited to those who can afford it. However, as computerized search services become an increasingly larger part of research library services, the issue will have to be faced as to whether or not the cost of this library resource is an obligation that should be borne by the institution. The increasing availability of national indexes, scientific abstracts, and so forth in computer systems rather than in hard copy form also may force a hard look at the proportion of the Library materials budget to the total Library budget notwithstanding the fact that continued inflation and the information explosion continues to erode the buying power of the acquisitions budget.

The use of computerized information has increased the dependency of the Library on the private sector. Most information retrieval services are sold by private businesses, such as Lockheed, and the cost of those services is subject to the whims of the market-place and the profit motive. With respect to the use of microcomputers in reference services and bibliographic instruction, the Library is subject to the necessity of relying on vendor software and to frequent updates on software or hardware with the resultant necessity of staff retraining. Computer training has been and probably will continue to be a substantial expense to libraries, and software costs, either through leasing or outright purchase, have added a new dimension to the Library budget.

Hard decisions will have to be made in the next five years regarding the nature of library resources and services to be offered, the optimal use of those resources, the desire and capability of the institution to meet new funding requirements, and the most cost-effective ways of serving the academic community.

Collection Development

Funds available for books, including state allocations, endowments, and grants, plus a systematic approach to book selection, placed UNC 14th in volumes added in FY 1981/82, according to the latest published Association of Research Libraries statistics. In the past few years we have witnessed a high degree of expansion both in number of subject areas covered and in level of coverage. In terms of acquisitions, UNC-CH should continue to rank in the lower teens nationally, provided that an adequate level of funding can be maintained. Collection development goals, however, will be expressed less in volume count and more in terms of accessibility of materials. The whole five-year period will be marked by striking a proper balance between acquisition of materials and providing electronic access to information. The Library will have to analyze the costs and benefits of providing electronic capability to reach other collections versus continued purchases of the materials themselves.

Serials will continue to consume a larger and larger share of the budget, so that by 1988 they may represent 50% or more of the available funds. At an average 13% inflation rate per year, the serials we now receive will cost 84.2% more in 1988. The subscription price of a series represents only part of its cost; binding, space, and preservation must also be reckoned as serials costs. At the beginning of the five-year period in question, we face the immediate need to add a limited number of carefully selected new serial titles. At the same time a serials review project involving faculty is underway with the goal of eliminating some serials whose absence would not detract significantly from the quality of teaching and research. By the end of the five-year period, the electronic publishing of journals will have progressed enough to cause the Library to feel more strongly the conflict between acquiring paper copy and providing access.

Because the Library has been able to make significant retrospective purchases in recent years, the 1974 Lacunae Report which identified sizeable gaps in the research collections at that time will be largely obsolete by 1988. Within the next few years faculty may be asked to participate in another study to identify any remaining collection deficiencies; these should be far less serious in view of the progress made since 1974. By then, the bibliographers, through various collection development techniques, will have further refined their knowledge of relative collection weaknesses and strengths. With automated cataloging and acquisitions systems we will be able to analyze our collections better.

By the end of the next five years, faculty probably will see an increased level of resource sharing among libraries on both local and national levels. Because of the online catalog of the TRLN network, and the potential of computer terminals in academic departments to access the catalog, faculty will tend increasingly to consider the libraries of Duke, North Carolina State, and UNC as one resource. Further, as we get electronic access to information we will be able to interrelate better with other units on campus such as the Carolina Population Center and the IRSS. Increased access should promote the trend toward centers of responsibility for collecting in certain areas, and probably for cataloging as well.

If a down-turn in economic conditions results in a reduction in book funds, faculty may be more frequently consulted about setting priorities and limitations of collection development expenditures. Hard choices may have to be made between the amount of funding allocated for current vs. retrospective materials. Antiquarian and other costly retrospective purchases from State funds for the general collection may have to be curtailed. Obviously, such a reduction would have ramifications for other areas as well. A hard and close examination of the total serials acquisitions program would have to be made. Scholars might have to depend more on a rapid loan and delivery service, and librarians would have to work to increase the speed of service. There is also the possibility that monies currently available for books and serials will have to be channeled into preservation and automation projects--usually expensive endeavors--unless alternative sources of funding can be found. Furthermore, the Library will need to heighten its efforts to find private or corporate sources of funding to offset the expected decrease in federal funding of libraries.

Changes within the larger society and more specifically the publishing industry are acutely felt in library acquisitions practices, influencing to a considerable degree the types of materials that are purchased. By 1988 machine-readable information will be more prevalent and will also demand a share of available funds. Further, the scholarly publishing industry is not as vigorous as it once was. Many graduate programs are declining and fewer dissertations are being published. In some subject fields there are fewer monographs to be bought. There has been some growth in the number of scholarly series, but new series often do not survive. These publishing trends are likely to be with us still in 1988.

Electronic publishing will create problems of copyright, ownership, access, and service to be resolved. In the course of re-orienting scholarly communication to accommodate this recent phenomenon, the character as well as the role, of research libraries may well undergo fundamental changes.

Changes in the type of materials used by the university community also necessarily affect the Library's purchases. It seems almost certain that undergraduate education will rely more heavily in future years on AV materials such as video cassettes and sound recordings. This technology is now so commonplace in society that its use in education can be taken for granted. Some of these products, now in constant or daily use, are nevertheless quite fragile and will need to be replaced regularly. Some of it now is required in multiple copies to satisfy demand. As the University's use of AV materials increases, so will the percentage of the Library budget which is required to support this technology.

By 1988 it is expected that there will be some increase in the proportion of microform holdings to hard copy materials. Purchases of dissertations in microfiche will become more prevalent. The use of microfilm for serials also is expected to grow. There is expected to be a major change in the nature of the Federal documents collection. A larger percentage of documents currently are being made available in microfiche only, and the Government Printing Office has indicated that this trend will continue. Documents formerly provided gratis will have to be purchased. This means that more microfiche readers and perhaps printers will be needed in BA/SS. As all major government indexes now are available online, increased usage of database searching for processing of materials by staff is expected. Computerized processing of documents is likely to begin sometime during the period. Finally, the physical deterioration of the poor paper stock used in the 19th and 20th Centuries will dictate an increase in microfilming for preservation purposes. A major change in the new building is that microforms will be housed mostly in specialized cabinets rather than on open shelves. The use of microprint (a white, opaque card) is being phased out. The use of microfiche is growing rapidly, and a new reader/printer will be purchased to accommodate this trend.

The United Nations and other international bodies have begun removing periodicals from depository status. Indeed, in many cases, the agencies are no longer publishing the periodicals as documents. Instead, many publications are being contracted out to commercial publishers. Thus, some items which have been part of the documents collection may need to be purchased and cataloged, and staff will need to be aware of the change in status. There is also the danger that some titles may have to be dropped since the UN has indicated that the trend will continue, and budgetary strength is not expected to grow accordingly.

Finally, an increased level of communication between bibliographers and faculty regarding selection of materials should be facilitated by the physical arrangement of the new central library. In the Davis Library, the Collection Development Resources Center has been specifically designed as a comfortable place for the examination of approval plan books and bibliographical tools, and for faculty-librarian discussions.

Access to Collections

Between 1984 and 1986, the Library will make an on-line catalog available to the University community. A computer output microfilm catalog (COM) also will be made available. The online catalog will contain virtually all materials cataloged since 1977. The existing card catalog will remain available for items cataloged before that date. The online catalogs are being developed by the Triangle Research Libraries Network (TRLN) consisting of the libraries of UNC-CH, Duke and North Carolina State. Conversion of the retrospective pre-1977 data in the old card catalog is a long-range possibility for UNC, but there are no definite plans for such a conversion at this time. Duke does not have any plans for a retrospective conversion. North Carolina State has been working on such a project for several years and conversion is virtually complete.

The online catalogs of the three institutions will remain in separate databases, but the user will be able to search all three from the same terminal. Each of the three institutions will have the same searching capabilities. Data from the Duke and North Carolina State catalogs will be accessible to the UNC user in the same manner as the data from the UNC catalog. The database already exists in the form of archival tapes. Beginning in spring 1984, there will be testing of the first public access components of the system. By the spring of 1985, there should be a publicly available online catalog. Eventually, there will be a number of terminals placed throughout the Library system and in academic departments. Their number depends, of course, on the availability of funds. A major advantage of the online catalog to faculty is that it will be available to anyone who has access to a terminal in his or her office or department without the need to come to the Library. Another major advantage is that scholars will be able to use the holdings of the three institutions as a single resource.

Although its current focus is an online catalog, TRLN's larger goals include automation of many of the technical functions of the Library such as acquisitions and circulation. These developments also will enhance access to the collections. The centralization in an integrated online system of many of the Library's current separate files may have significant consequences to both Library patrons and staff. For the public, it could mean that information about serials, books on order, books received but not yet cataloged, or books on loan could be available through the single medium, thus expanding the concept of a library's "catalog." In answering reference questions or searching resources Library staff would not only be able to tell more expeditiously if a book were owned, but also if it were on hold, on order, or in a processing backlog. The placement of serials information online would simplify and eliminate a proliferation of serials files and would be especially helpful to the departmental libraries. Increasing centralization of information and dependancy on electronic media may have significant organizational implications. The library of the future may require new structures as yet undefined.

One of the advantages of computerized files is that only one master record exists for all users and thus all users can see the current status of any item at any time. A second advantage is that users in departments and branches will have full information on all Library holdings throughout the system and, moreover, branch staff will be able to communicate directly with the catalog to enhance record-keeping. Both these advantages will play a part in the ever-growing process of moving Library materials around the University. Although the books themselves may not move more quickly, the record-keeping should be greatly speeded up with the public almost instantly aware of a new permanent or temporary location of a book. It is not yet clear what relationships might exist between a library's electronic files and other online resources available on campus, but it is likely that some interchange will be feasible and desirable. However, the resolution of this problem involves issues of proprietary rights, confidentiality provisions, etc.

The titles and locations of periodicals in federal and international documents collections will be added to the campus serials microfiche lists within the next five years.

The move to Davis Library will facilitate the use of interlibrary loan by faculty. Requests will be placed at the Humanities Reference Desk where longer hours of service and access to the reference department staffs will be available. The physical layout of the Library, automation of the card catalog, and use of other union catalogs should speed verifying request information. The continuing development of

TRLN is expected to increase interlibrary loan activity among the three Triangle institutions for both cataloged and perhaps unprocessed material if such information is in the files. This demand will probably necessitate some speedier method of obtaining books for faculty from these libraries than existing interlibrary loan procedures.

Access to these libraries' collections may be enhanced by a proposed bus and courier service among the campuses as well as a proposed document delivery service for photocopied journal articles. Newer electronic techniques of document storage and delivery such as electronic mail could be part of future planning for improved access to materials.

Because the Academic Affairs Library is a major lending resource both for North Carolina and the Southeast and because collections should be strengthened with a continuation of adequate funding, UNC faculty probably will not need to borrow any more from other libraries in 1988 than they do now. Requests from other libraries for loans from UNC are expected to increase. When our faculty borrows, however, they are likely to encounter fees charged by the lending libraries more frequently. Fees ranging up to $12 are already charged by many institutions, including Harvard and Yale, from which older materials are sometimes requested by this faculty. This Library does not plan to subsidize such fees for the faculty, although it will continue to use whatever negotiable coupons it receives from loans to these libraries whenever possible. If journal subscriptions are cut because of the increased selectivity necessitated by continued subscription price increases, faculty will need to request more photocopies through Interlibrary Loan. Copyright guidelines currently in use limit a library to a maximum of five orders in a calendar year from any journal published within the last five years. Out of 109 titles requested last year only three titles reached that limit, so this requirement is a small problem which may worsen only slightly within the next five years.

The Library is a member of the Center for Research Libraries (CRL), a consortium that allows member libraries to borrow valuable resources which would be impractical, or impossible, for each library to own individually. For instance, CRL owns or will purchase and lend to member libraries almost any foreign dissertation. Also, it can supply many of the microfilms formerly loaned by the National Archives, whose loan service recently fell victim to budget and staff cuts. CRL also is proposing to improve its periodical holdings, making expensive, rarely used journals available to member libraries. It is hoped and expected that use of CRL resources by this Library will increase during the next five years. For, although CRL provides a valuable resource for scholarship, its membership fees are extremely high. Unless we can justify the cost, budgetary constraints may raise the possibility of cancellation of membership.

A considerable backlog of uncataloged material will undoubtedly continue to accrue in the foreseeable future. Its size will depend on future funding for books and staff as well as the stability of OCLC, our computerized cataloging utility. Attention is now being focused on increased management of the backlog to improve access for users. The main priority for improving backlog control is physical centralization of all books not yet cataloged, which will be possible in Davis Library and the resultant centralization of responsibility for handling faculty requests for uncataloged material in one person or office.

To cope with large backlogs, UNC and other research libraries are considering some kind of brief cataloging as the permanent catalog record for certain types of material. There is still much debate on the question of how little is enough, with focus on whether subject access is necessary for all types of material. Practically speaking, a short author/title order record, available eventually as part of the online catalog, may indeed become a long-term access device for low-priority unprocessed materials. The general feeling, however, is that a short record, _sans_ subject heading, is not workable for government documents.

Reclassification of books from Dewey to Library of Congress classification is expected to stop as a full-time project in 1985. Remaining low-use books in Dewey will thereafter be reclassified only upon request.

It is expected that the quality of the cataloging of microforms will improve. Presently, many microforms collections are cataloged as groups only. A need for greater analysis of the components of each collection has been recognized. Ways to increase access to these collections through analytical cataloging and/or other means are expected to be found during the period.

When the Davis Library opens in 1984, the 1977 stack addition to Wilson Library will be used as a repository for lesser-used general collection materials and overflow of lesser used materials from departmental libraries. Every effort will be made to put in the Wilson storage stacks only those books which are determined by statistical analysis to be seldom used. A paging service will be available at Davis Library by which faculty and students can obtain materials from the inactive general collection stacks in Wilson Library within a reasonable period of time. There will be no direct access to the Wilson stack addition during the renovation, and future public access is still undecided. These materials, however, are expected to be requested very infrequently, and the paging service may prove to be more economical and practical in the long run than a Wilson circulation desk.

Security in Davis Library will be improved by an electronic book detection system like the ones in use at the Undergraduate and Health Sciences Libraries. Patrons will no longer have to wait in line to exit nor have their belongings inspected, and losses to the collection should be considerably reduced.

The Undergraduate Library and Departmental Libraries

The departmental librarians are fairly confident of their ability to continue to provide the instructional programs with the books and periodicals needed during the next five years. The Music Library sees itself pulling ahead of other music libraries in terms of its collection and considers itself fortunate in these difficult times to be able to purchase not only new books but also microfilms of rare manuscripts or the actual manuscripts themselves. City and Regional Planning, however, is concerned that their already slim budget for standing orders and for some important but expensive periodicals will not improve. Science library acquisitions traditionally are more adversely affected by a higher inflation rate for their books and periodicals than the non-science libraries.

It is anticipated that by 1988 each science library will have its own computer terminal for online searching. Online bibliographic retrieval continues to increase in importance as the growth of scientific literature continues to mushroom. Non-bibliographic databases are also expanding in scope and quantity and will soon be indispensable in the scientific disciplines. Several major scientific journals are now being published electronically as well as in conventional forms, but by 1988 there may be important journals that are available only in an electronic format. For some highly specialized publications electronic availability may be a cheaper alternative to paper subscriptions.

The Undergraduate Library expects to be able to keep pace with current publications required by the undergraduate instructional programs, but by 1988 this Library will be close to or at maximum capacity. UL hopes to weed its collection of unneeded multiple copies and outdated books by that time. The cataloging backlog will affect somewhat the pace with which UL is able to weed its collection, however, because it slows the rate at which transferred books can be accepted by the main library.

Current services in UL such as term paper and research consultations, interlibrary loan, bibliographic instruction, computerized literature searches, reserve collections, and acquisitions lists will be maintained. (There also will be a reserve in the Chapin Library.) Current use indicates the need for an expanded non-print collection, facility, and staff, and UL hopes to meet this need, at least partly, within the next five years. The Undergraduate Library also hopes to have online computer search facilities by 1988. Static staffing and equipment expectations indicate no significant expansion of service in any of the other libraries. It is likely that the BA/SS and Humanities Reference Departments in Davis Library will still be relied upon for computer searching by the non-science departmental libraries.

New technology will affect all the departmental libraries in varying degrees. The TRLN online catalog will have a substantial impact on the science libraries. The Music Library also expects to have access to its own terminal for automated cataloging of its materials. Given adequate funding, all the departmental libraries also will be connected to the online catalog and circulation records. This advance will provide bibliographic access to the holdings of area libraries, mitigate some of the inconvenience of dispersed collections, and speed processing of transfers to the Wilson Library storage stacks.

Attempts will be made to provide necessary new technology to the departmental libraries through alternate sources of funding should State appropriations prove inadequate. Wherever possible each individual library should independently pursue possible sources of funding. Separate requests for small amounts from several sources will increase the chances for successful funding.

The perennial problem of space will continue to plague all science departmental libraries, as it is unlikely that adequate funds will be allocated for departmental expansion in the near future. By 1988 space may be a problem for the Undergraduate Library also if the collection is not weeded. The space problem will worsen in the Music and Planning Libraries. These problems will be alleviated considerably by transferring lesser-used volumes from the departmental libraries to the renovated Wilson Library. The move of the central collection to Davis Library will open up space in the 1977 stack addition of Wilson Library for transfers from other libraries on campus, thus alleviating problems of overcrowding elsewhere.

A Task Foce on Transfers has been established to address the question of the operation of Wilson's stack addition as a repository for transfers from other libraries, including low-use materials from Davis. This Task Force will study the concomitant record-changing requirements for these transfers, the organization of stacks, and circulation policy for transferred materials. A close coordination with the already existing Task Force on the History of Science will be maintained. The Health Affairs Library is also interested in transfers and will have a representative on the Task Force. With the older and lesser-used materials moved first, it is anticipated that inconvenience to faculty in obtaining transferred materials will be minimal.

Both the move to Davis and the implementation of the online catalog may have an effect on the demand for changes in the present document delivery service. At present, the current on-campus system seems to be functioning smoothly with outlying library deliveries once a day and central campus mail deliveries four times daily. However, there already is considerable interest in improving the efficiency of document delivery between campuses in the Triangle Area. The online catalog should increase this demand.

Within the next five years space problems in the Music Library may force graduate students there to use the study facilities in the Davis Library more frequently. On the other hand, UL foresees a probable easing of demand for study space as students move over to Davis. This development may ease the cramping from the growing collection or allow needed space for expanded non-print facilities. Space in the renovated Wilson Library will greatly facilitate access to the Folk Archives for music students and faculty.

The Special Collections

Renovation of Wilson Library for the Special Collections will begin in the Spring of 1984, and the building is expected to be ready for occupancy in late 1986. During the period of renovation these Collections will occupy and provide service from restricted quarters in the 1977 Wilson stack addition. The rest of the building will be closed. After renovation is completed, Wilson Library will house the North Carolina Collection (including the Photographic Services section), the Rare Book Collection, the Manuscripts Department (including the Southern Historical Collection and the University Archives), the Maps Collection, the Non-Print Research Collection under the direction of the Media and Instructional Support Center, and some other non-collection related media offices.

The North Carolina Collection, the Rare Book Collection, the Manuscripts Department, and the Maps Collection all will have increased space for additional collections, improved research and working facilities, greater security, and preservation/conservation centers. Additional space will allow interrelated materials which previously have been stored on separate levels and at a distance from the reference and administrative sections to be more conveniently housed.

The North Carolina Collection will occupy the first or main floor of Wilson Library. This Collection will retain, without change, the special rooms located there already, including the Raleigh Room and the Early Carolina Room. These special museum-type rooms which depict portions of North Carolina history will be open to the public. Another such room will be incorporated into the new reading room during the renovation. This new period room will be devoted to North Carolina author Thomas Wolfe. In addition, the present reading room will become a North Caroliniana gallery, and the Collection will add an audio-

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visual area where the catalog room is now. On the first floor there also will be an assembly room and the office of the Associate University Librarian for the Special Collections.

The Rare Book Collection will occupy the second floor. The grand room which presently houses the Humanities Reference Department will be left largely intact, but will be refurbished and become the Rare Book Collection's reading room with some special donor alcoves. There also will be a meeting room, a common staff room, an office for the Friends of the Library, a special room housing the Ashantilly Press and the proposed new History of Science Collection.

The Manuscripts Department will occupy the third floor. Department space will contain a seminar room for the use of visiting classes and other groups, several special search rooms and generally expanded and more comfortable areas for research. The Maps Collection will be housed on the ground floor.

Increased space will allow for re-invigorated collection development programs. Although acquisitions will continue during the renovation period they will still be curtailed somewhat because of severely limited room for housing materials. Collection development programs that are being planned now will begin to be fully implemented when renovation is completed. For example, the Manuscripts Department will be able to expand its collection of 20th century records. The Literary Collection will add more rare literary manuscripts and other unpublished papers of authors. The University Archives will receive more University records from other University locations. The Rare Book Collection will continue its development of the Hanes Foundation for the Study of the Origin and Development of the Book and add sizable gift collections as it has in the past. The Maps Collection will be able to acquire the maps of the U. S. Geological Survey.

Added space will provide surroundings more conducive to scholarly research as well as work by the staff. Researchers will find comfortably furnished and enlarged research work areas. Cramped and ill-lighted areas will be eliminated. For special collections research, which normally requires lengthy stays, the new atmosphere should be quite popular with the research community. Working areas for the staff also will be more adequate and pleasant, permitting greater efficiency in reference and technical services.

The three Special Collections will make use of automation with respect to cataloging and bibliographic information on rare and valuable materials. For example, the MARC (national) format for bibliographic records has recently been expanded to include ways to accommodate information about the printer, place of publication of early printed books, and also what is called "copy-specific" information, such as bookplates and autographs of previous owners. Automation wil open up new areas of study for early printed books. In addition, machine-readable databases such as the *Eighteenth-Century Short Title Catalogue* will be available for the study of early printed material. Methods to provide both bibliographic databases and in-house operational control for manuscripts and archives also are currently being developed.

Preservation activities are expected to increase. The Special Collections hope to develop a fully-equipped restoration bindery in the renovated Wilson Library that would enable them to do such things as furnish properly protective boxes for books and conduct "flat-paper" deacidification of posters and broadsheets to halt the deterioration of paper. (Deacidification of books is more complicated, and the technology to do that will probably not be widely available for another decade.) Fumigation of books and manuscripts will also be done on the premises.

The renovated Wilson Library will provide for complete monitoring of temperature and humidity controls. Shields against harmful ultraviolet light will also be used for stacks, display cases, reading rooms, and work areas.

Because the Special Collections contain items of great monetary and research value and require added security measures, each department will curb the possibility of theft and mutilation by surveillance systems, special alarms, and locking mechanisms. Fire and other warning systems will be updated and made more efficient. Vaults for extremely rare materials will be provided for in the North Carolina Collection, the Rare Book Collection, and the Manuscripts Department. The vault in the University Archives will house vital records of the University.

The physical separation from the Davis Library may create some difficulties with patron access to secondary reference materials. However, the cost of duplicating core reference materials is prohibitive. Systems for facilitating access to reference materials in Humanities and BA/SS will need to be developed to minimize inconvenience.

Communications Systems and the Library

Plans are being formulated for a greatly expanded campus communications system. Within the next year a broad-band cable system should be installed. This system will form the backbone of a video/audio/data transmission system to which locations both on and off the campus then can be connected. For instance, the Library's computerized bibliographic data files eventually could be transmitted to a faculty member's office microcomputer via this system. Electronic mail and computer conferencing are other capabilities. The campus also would be able to tie in to off-campus networks such as those at the Research Triangle Park.

By 1985 the Non-Print Collection in the renovated Wilson Library should be operational. Here the Media Center will be able to offer expanded instructional and research support services to the faculty, such as, video and audio processing of non-print research materials. Some video-equipped carrels presently exist in the Undergraduate Library.

Determination will be made soon of responsibility for programming on Village Cable's University access channel. This channel is already in place but has not yet been utilized.

A grant proposal is being developed by Associate Dean of General Education William Graves which would place as many as 320 microcomputers around the campus by 1986 for the use of faculty and students. A cluster or two of several microcomputers each would be located in the Undergraduate Library. The courseware to be developed by faculty for one cluster would focus on the required Social Sciences perspective of the new General Curriculum; the other on the Humanities perspective. Both clusters would provide some text editing/word processing opportunities and tutorial software packages in basic math and writing skills. Several printers would serve each cluster, and at least the BASIC programming language also would be available. One cluster with an assigned staff will be located in the Davis Library on the second floor to instruct interested faculty in the use of micros.

Library Issues

1. Should machine readable data files, such as computer tapes of U. S. Census data, be considered a legitimate collection and public service responsibility of the Library?

2. To what degree should facilities and staff for searching automated databases be increased, and to what degree should this service be funded by the State or provided on a user-cost basis?

3. Does there need to be a full-time Online Information Coordinator position established in the Library?

4. What steps can be taken to hold down the serials share of the library materials budget to reasonable proportions by identifying and cancelling non-essential subscriptions and by evaluating the value to research and scholarship of new publications?

5. As resource sharing becomes increasingly common among research libraries, which of the many special subject collections within our main collection should we emphasize and support as being a unique local, regional, or national resource?

6. Is there an expanded role for audio-visual materials in the research library of the future? Should the central library participate in the campus video cable system and provide TV facilities to its users?

7. What level, distribution, and type of access to the online catalog is required for it to replace the card catalog? What is the proper basis for funding the costs of terminals and telecommunications?

8. Should the Library continue to participate in the Center for Research Libraries?

9. Will future use of the lesser-used central collection materials housed in Wilson Library justify the maintenance of a separate circulation desk, or should all materials circulate through the Davis Library? Should the Wilson Library repository be a closed stack facility?

10. Is a study necessary to identify the space problems of the departmental libraries and to identify a long-range plan for their solution?

11. What data in bibliographic records are essential to the user in locating information about library materials? Does the advent of online public access catalogs call for a reassessment of the data in the conventional bibliographic record and the traditional view of the functions of the catalog?

12. What will be the impact of home and personal computers on the use of a research library and what users expect of the library?

13. To what extent should librarians participate in the education of students in library usage and information-seeking skills?

14. What steps should be taken to establish an effective preservation program for the Library?

15. What new methods of document delivery should the Library be exploring to facilitate access to resources?

16. To what extent should the Library participate in national and international groups and meetings? Are written policies and guidelines needed in this regard?

REPORT OF THE AD HOC COMMITTEE ON FUTURE INFORMATION SERVICES AT THE TEXAS A&M UNIVERSITY LIBRARY

by
Colleen Cook, Chairman
Kathy Jackson
Evelyn M. King
Jay Martin Poole
Leslie D. Steele

August 13, 1984

REPORT OF THE AD HOC COMMITTEE ON FUTURE INFORMATION SERVICES

Introduction

The charge to the Ad Hoc Committee on Future Information Services was to explore future directions for informational services at Texas A&M University Library and to develop a plan to guide the Library in terms of automated access to information into the next decade.

In exploring future directions for automated information services, the Committee members researched and wrote papers on the following topics:

1) the user

2) information

3) access to information
    a) means and technology
    b) the role of libraries in the future
    c) the role of librarians in the future
    d) macro and micro organizational considerations for libraries in the future
    e) fiscal considerations.

These essays are attached to the report as appendices.

The body of the report consists of a series of recommendations organized under each of the broad topics outlined above. As a whole, these should be considered as a plan to guide the University Library through the upcoming decade.

Philosophical Outlook

Underlying the recommendations are several principles which guided the Committee in its deliberations. Premier among these principles is the concept of utilizing informational technologies to enhance levels of service to users. The Library will aggressively seek to integrate electronic information transfer capabilities as they become available, feasible and cost-effective. Two major goals became clear in the course of the Committee's discussions: (1) to supply information in all forms to users on a no-charge basis, and (2) to establish the University Library as the primary information center on campus. A prevailing thread through the Committee's deliberations was the recognition of the extraordinary demands that will be placed upon library managers in the next decade. Library administrators must carefully choose a path which will take advantage of developing technology without losing the benefits of traditional information control. Difficult decisions must be made. A delicate balance must be struck, for instance, in allocating funds for purchasing printed materials and providing online access to users. Finally, discussions of the library user dominated every topic investigated by the Committee.

Users

Within the next twenty years, the definition of the Texas A&M University user group will change significantly. Technology will extend the sphere of the Library's influence beyond present geographical boundaries. Future users will be more computer literate than users of today and will be more demanding of the benefits available to them from computerized services. User training in new information technologies will be a critical issue facing librarians in the upcoming decade. Librarians must be prepared to train several levels of users who will have varying levels of sophistication in automation.

It can be expected that some users will continue to need the most basic of instructions in library use, while others will seek proficiency in online searching at varying levels of difficulty. Thus the teaching function of the academic librarian will not diminish in the future; the need to acquaint the uninitiated with informational resources and their access will remain a significant function of the librarian into the foreseeable future.

Although the use of improved technologies will foster the growth of the University Library's user group, levels of responsibility to the varying segments in the expanded user group will not be equal. Roughly speaking, users in rank order of priority might be considered as follows:

1) students (former and present), faculty and staff of the TAMU College Station campus;

2) TAMU system personnel and students;

3) HARLIC users;

4) local area residents;

5) Texas state residents;

6) U.S. residents;

7) international users.

Recommendations

The User

1) An emphasis should be placed upon user training during the transition from a print to an online mode of information transfer.

2) The University Library should strive to offer remote access capabilities to local bibliographic databases and to other automated databases.

Access to Information

Means and Technology

1) As is practical and feasible, the University Library will substitute electronic access for information sources previously published in printed form. Little used and/or expensive titles will receive first consideration for such substitution. Cooperative purchases of electronically stored information will be considered.

2) Full document delivery to campus users should be instituted as soon as remote access to local bibliographic files becomes commonplace. The viability of a full document delivery program should be phased in by offering services to West campus users in the near future.

3) The Library should aggressively pursue options for providing electronic access to uncataloged collections.

a) The use of commercial databases for providing partial access to some uncataloged collections, e.g., NTIS and U.S. documents materials, should be expanded.

b) If an uncataloged collection is viewed as a suitable candidate for cataloging through a cooperative project, the Library should not catalog it locally. The Library will seek to engage in cooperative cataloging projects to fulfill a professional responsibility and to gain access to cooperatively produced machine-readable bibliographic data.

c) The Library should provide local access to all uncataloged materials considered unique or otherwise unsuitable for bibliographic control through multi-library cooperative projects. Local access assumes a wide range of bibliographic control. Some categories of uncontrolled materials should be assigned an indexing type of access, while others should be assigned partial or full cataloging types of access.

4) The Library will provide remote access to materials housed in the Library and to other material available through library services.

5) The Library will provide the means for users to serve themselves when technology permits through the performance of their own searches.

6) The Library should assume responsibility as principal catalyst for obtaining funds and resources, and for providing services in satisfying informational needs of users.

Access to Information

Organizational Considerations

Macro Considerations

1) Printed and electronic versions of the same information should be bibliographically controlled together. The format or form of information will not be the overriding organizational determinant; the substance of the information will prevail.

2) Job descriptions for library staff should be rewritten to include some combination of computer literacy, an emphasis upon subject specialization when appropriate and other non-traditional skills.

3) The Library should evolve in tandem with the application of information technologies and user needs. Flexibility and innovation in organization will be of extreme importance now and into the future. Specific needs and their significance to the Library organization can be expected to change quickly and radically. Staff should be allocated in light of need; a continual reassessment of staff needs is recommended as the environment changes. Staff should be moved as dictated by demand. Organizational models other than the traditional pyramidal structure, e.g., a matrix pattern, should be considered in light of future needs.

Micro Considerations

1) A fund raising unit should be established in the Library to generate the large amounts of funding necessary to purchase equipment for automated services and other needs.

2) An automation staff person should be added to deal with public information systems.

3) The Library should strive to participate as a leader in networking and similar cooperative systems, e.g., bibliographic utilities, and regional and national automated informational services.

4) The Library should strive to become a center for storing and servicing data files. Other campus facilities involved in working with such files should be coordinated through

the Library in order to maximize use of funds and staffing and to ensure the concept of centralized information control.

5) The Library should strive to take advantage of new technologies and to participate in new modes of information distribution as available.

The Role of Libraries

1) The Texas A&M University Library should promote flexibility in moving from a print-on-paper orientation to an online access mode of thinking. Libraries as warehouses of printed information will decline rapidly in relevance in the next decade.

2) The concept of the library without walls should be tested immediately by offering remote access to Data Phase and full document delivery services to West Campus users.

3) Planning should begin immediately for the construction of a new building to satisfy space needs of the Library. While new technology will provide more efficient means for storing data, it cannot be relied upon to solve all of the Library's space problems. The concept of off-site technical processing should be explored.

4) The Evans Building should be immediately reassessed and reviewed for space utilization in light of new technologies and changing staff and user needs.

5) Patterns of collection development should be redirected to include the following principles and/or concepts:

a) Collection development efforts shall emphasize the acquisition of space-saving formats such as micro and electronic formats with maximum retrieval capabilities.

b) On a case by case basis, the Library should eliminate expendable materials, e.g., print duplicates of journals and indexes available online.

c) Materials budget allocations should be expended with the uppermost goal of satisfying user informational requirements; i.e., access to information will be the critical issue in the future and not the storage of information in printed form.

d) The Library should become a center of an automated information network on campus.

The Role of Librarians

Recommendations

1) Funds and time should be allocated to retraining professional staff in automated information applications as they become available.

2) In view of technological advancements and the University's emphasis upon graduate education, there will be an increased need for subject specialization in the professional staff. As a result, an increased emphasis should be placed upon recruiting staff with advanced degrees in addition to an MLS.

3) The Library should bring pressure to bear in the profession at large to train library science students in innovative information technologies.

4) The Library should place a high priority upon becoming nationally competitive in salaries in order to attract the most qualified people.

5) Staffing needs should be continuously reassessed in light of service needs.

Fiscal Considerations

Recommendations

Introduction

To provide automated services to users on a regular basis, it will be necessary to reconsider traditional library budgeting philosophies. Materials budget lines might be renamed "Acquisitions and Access" lines to conform with a shift in emphasis from owning to accessing informational sources. It can be expected that there will be a gradual shift in the ratio of acquisitions and access budget lines from acquired printed sources to access services over the next ten years.

The consideration of charged vs. no-charge services will be of great importance. Eventually, the Library should supply information to users on a no-charge basis no matter how the information is accessed or acquired. It will be of some significance, therefore, to allocate regular sources in the Library's budget for access services. A gradual, phased-in approach to incorporation of access services into the mainstream of library services will be based first upon the consideration of feasibility and practicality both in terms of funding and staffing. In forecasting a phased-in approach the following recommendations could be made:

1) The graduate student AIRS program begun in the fall of 1983 should be continued and expanded.

2) There should be an increased acquisition of backruns of periodicals in microformat; de-selection of hard copy equivalents should progress in tandem with acquisitions in microformat if use patterns allow.

3) On a title-by-title/case-by-case basis substitute access to online indexes for print subscriptions.

4) The Library should provide dial-up access or unlimited in-house use of databases for which the Library would pay a fixed fee for unlimited access.

5) The Library should provide current awareness services.

6) Non-bibliographic databases should be made available to users on an unlimited access basis if cost-effective and feasible.

7) Full-text databases should be made available to users on an unlimited access basis if cost-effective and feasible.

8) Acquiring databases and allowing users unlimited access in the local environment should be considered.

9) In view of the change in emphasis from owning to accessing, the Library should recommend that ARL consider access budgets, e.g., funds spent on automated information retrieval services and the number of databases accessed, as significant statistics in determining library quality which should be compiled, analyzed and disseminated as part of the ARL Statistics; particularly as a variable in the ARL Library Index.

10) The Library should allocate additional staff positions to meet the increased demand for automated services.

11) The Library should allocate funds for professional staff development for retraining, updating skills, and providing opportunities for staying abreast of developing technologies.

12) The question of access to electronically transmitted information gives rise to the problem of supplying copies (printed, tape, diskette, etc.) of information accessed online to users. The Library should gradually move to providing copies of such information on a no-charge basis. Again it can be expected that such duplicating services will be phased-in as practical and feasible.

Subject to copyright restrictions, duplicating services would be provided for the following:

1) Automated Services

a) Holdings from the online public catalog

    b) Circulation information

    c) OCLC information from public access terminals

    d) Online printing charges for bibliographic data, full-text and non-bibliographic data

    e) Offline printing charges for bibliographic data, full-text data and non-bibliographic data

    f) Information retrieved from databases

2) ILL services

3) Microtext materials

4) Audiovisual materials

5) Software

6) ~~Xeroxing~~ Photocopying of printed materials

CAP TASK FORCE ON NEW NEEDS AND POSSIBILITIES

PHASE TWO REPORT

THE UNIVERSITY OF MICHIGAN

January 31, 1983

Task Force Members:

Grace A. Baysinger
James E. Crooks
Christina W. Neal
Jack W. Weigel, Chair

INTRODUCTION

In this "Phase 2" report we explore more deeply four of the subjects which were touched upon in our Phase 1 report: Scholarly communication, networks, electronic publishing, and impact on libraries and librarians. Although we have discussed in each section the implications for collection development, we have on occasion ventured beyond details immediately connected with collection development.

As an aid to readers, we have abstracted from the text a list of major recommendations and a list of issues affecting libraries; the two lists may be found immediately following this introduction.

In summary, we believe that new developments in information technology are beginning to affect collection development at the University of Michigan and that the effect will continue to grow over the next two decades. Although publications on paper and in microformats will continue to be important in academic research libraries, an increasing fraction of acquisitions funds will have to be expended on access to information in such novel formats as video disks and online publications. We hope that our report will help to point the way toward handling research information in the future and the role the Library will play.

The Task Force conducted an extensive literature search and interviewed University librarians Maurita Holland and Richard Dougherty.

In order to give the reader the background to understand how electronic processing will affect collection development, the electronic library and its components are described.

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Grace A. Baysinger
James E. Crooks
Christina W. Neal
Jack W. Weigel, Chair

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RECOMMENDATIONS

1. Organize a staff unit to manage the integration of electronic data processing into library operations and reference/information service. Systems office staff should be the nucleus of that organization.

2. Since the University has a responsibility to prepare students for the information technology workplace, the Library should actively support this goal. Every effort should be made by the Library to expose students doing research to information seeking via computer technology. This will result in new interactions among faculty, students, Computer Center staff, and Library staff.

3. The Library should support and prepare for the evolving technology being used in scholarly communication. Staff could take an active role in the management of information for scholars on a one-to-one basis.

4. The Library should make available electronic formats as publishers market and scholars need.

5. The Library should include the new electronic formats as appropriate expenditures from the collection development funds.

6. The Library should establish a series of seminars to keep the University community including Library staff abreast of changes in information transfer.

7. The Library should provide training programs to enable staff to assume new job tasks as required by the introduction of technology to the workplace.

8. The Library should provide access for staff in all Library Units to existing technology, e.g. microcomputers, MTS.

9. The Library should encourage and reward individuals who are creative and innovative in the application of technology to improve library services and operations.

10. The Library should provide access to library resources and databases as part of the developing campus computer network.

11. The Collection Development Office should make use of available data, e.g. size of classes, number of faculty in discipline, average cost of books in field, circulation figures, to manage collection development funds. As the integrated library system evolves, it will become easier to generate and manipulate these data.

ISSUES

1. How will copyright affect cost, availability, and use of information in electronic formats? Will the copyright law become meaningless as computers generate data and summaries of information. Will ownership of information become clouded as knowledge databases written by a number of scholars in a field create pieces of the same work?

2. Who will be responsible for organizing campus information resources as new technology evolves? If greater computer power is needed for using information resources, will the roles of, and relationships between, the Computer Center and the Library become more competitive?

3. Librarians will find information technology conventions and associations of growing interest and importance to them. Are the existing professional library associations addressing the issues facing the library community?

4. Selection criteria for electronic formats will need to be developed. What review sources will exist? Will materials be readable on all equipment?

5. Scholars will have the ability to function outside the Library in new ways. The reasons to call or visit a library may be different in the future. Help in "using" the source may be as frequent as advising what source to consult. The historical research collection will remain and with the passage of time its use may become a mystery to information seekers. Library users and staff will need multiple skills to access all formats within the collection.

6. There will be different rates of movement and acceptance by faculty of electronic access to information. This may effect the Library's organization, decision-making in collection development, allocation of resources, and staffing patterns. The science/technology information network may be the first one to exist within the Library because of forces outside the Library. The biomedical libraries may also have available new information sources sooner because of developments by the National Library of Medicine and ongoing Congressional support for a health sciences information network.

SCHOLARLY COMMUNICATION

INTRODUCTION

Although scholarly communication has only recently been recognized as a branch of research in its own right, interest in what scholars use and how they find out about it goes back many decades. Librarians realized early that in order to build their collections intelligently they needed to know the answers to such questions, and that answers had to be more than impressionistic. With the phenomenal increase in volume of publication and the financial constraints libraries have suffered, attention to all phases of scholarly communication has expanded greatly (Steig).

Librarians in major research centers are facing the difficult task of allocating increasingly scarce dollars among the vast and steadily growing numbers of books, journals, microforms, and other materials of scholarship. No longer able to develop or maintain comprehensive, self-contained collections; they are searching for new ways to organize limited resources in order best to serve the needs of teaching and research (Ibid).

As readers, scholars report a high degree of satisfaction with the existing system of scholarly communication. The high prices of books and their occasional unavailability in the university library are common complaints, but in general, scholars are satisfied with library services and with the quality and availability of books and journals (Scholarly Communication).

As authors, scholars have more complaints about the system. Pressures to publish for professional advancement are strongly felt and generally accepted; however, the view is widespread that quantity matters more than quality, a situation that many scholars resent. Refereeing is often viewed as too slow, and younger scholars express doubts about the fairness of that system. The delay from journal acceptance to publication is seen as a problem, particularly when career advancement is at stake. (The impact of delays on the course of scholarship is less clear) (Ibid).

DIFFERENCES IN DISCIPLINES

It is a commonly-held belief that academic researchers in the humanities and social sciences have typically made heavier use of the published literature in libraries than have most workers in science and technology. Even within the science/technology area, however, there are differences among the various disciplines in the attitude of researchers toward literature use. It is highly likely that the most extensive and earliest employment of the new information technologies will occur in the science-technology area. This implies that there will be a differential effect on the University Library system; the science-technology divisional libraries will be the first to be affected significantly by electronic publications and other new means of information transfer. In turn this could lead to increased strain on the sci-tech libraries' acquisitions if publications on paper continue at or near their present pace even as new information systems grow.

PRESENT AND FUTURE INFORMATION TRANSFER BY RESEARCHERS

At present university researchers commonly have at their disposal such familiar communication technologies as publication on paper, telephones, and videotapes. Those who have teaching responsibilities generally meet them through classroom lectures, seminars for advanced students, and (occasionally) authorship of textbooks. Communication of research information is typically handled by publication of articles in primary research journals and by participation in conferences.

Examples of the emerging new information systems are already at hand. Video discs, electronic publications, online retrieval systems, and other technical developments cited in this report and our Phase One report are now coming into use. Instructors will be able to reach their students via television hookups that could make the classroom obsolete. Researchers may stay at home and still "attend" conferences at which formal presentations are made by video. Researchers can also communicate with one another by way of electronic mail and contributions to "knowledge bases", communal compilations of research data receiving continual revision online. The effect of these and other developments will be to enable the researcher/instructor to work more from his/her office or home and less in classrooms, libraries, and conference centers.

This task force does not foresee an abrupt and total replacement of publications on paper and other traditional media for information transfer. Rather, the new information systems will complement those previously established.

THE LIBRARY RESPONSIBILITY

a. Libraries must be prepared to provide services based on the new technologies or face continually reduced usage. Academic libraries have a responsibility to prepare the students for information technologies as part of the academic resources of the institution. The same technologies will also change the basic media and possibly the basic form of education; libraries are a part of this process. The new products and services will be costly; the libraries and their institutions will be facing serious economic decisions. It is to the benefit of the patrons and institutions to have the library staff, administrators, and governing boards knowledgeable and informed about the services, benefits, and cost of available technology (Epstein).

b. Shifting boundaries of research disciplines also affect the development of a library's collections. Collection development librarians must not only be vigilant for new fields of inquiry, they must also remain conscious of changes within established disciplines. New discoveries occur which bond specialties; each new bond, in turn, generates its own core of new journals and specialized monographs (Dougherty).

The importance of a comprehensive library collection is easy to underestimate if one fails to recognize that no library, even the largest and most generously funded, can collect everything of potential significance to all scholars. The need to provide immediately relevant collections must be balanced against the need to collect materials which support disciplines not currently in vogue (Ibid).

c. The University is strengthening its ties to private business and to the U.S. Department of Defense. The need for confidentiality of research information in these areas could create a dilemma for the University Library, which is dedicated to broad dissemination of research information.

Recommendations

1. A series of workshops, seminars, discussion groups should be provided for library staff to introduce them to and keep them abreast of the emerging new technology. Experts in the field should be invited to make presentations on a regular basis.

2. The Library administration should establish a network of communication whereby all Library book selectors can be kept informed of new academic programs so they can relate current acquisitions to curriculum development in the various Departments, Colleges, and Schools which the University Library system supports.

INFORMATION SYSTEMS

In the next 20 years major alterations will occur in the way information/knowledge is stored, organized, presented, and disseminated. A diversification of formats and systems will also occur, so that users with diverse problems can tap into pertinent systems and services easily and more profitably than today. Consumers, policymakers, research scientists and corporate managers will become more information literate. They will require, indeed demand, that they have some degree of confidence in the reliability and pertinence of the information provided them. Such information literacy also implies that heavy users of information will of necessity develop defenses against overload, filters that allow them to better sense the benefits and costs within their own contexts. Information system designers and information providers will need to help build such literacy. This means that the information professions, both at the service as well as the research end, must have a better sense of the processes for meeting information demands in economic and benefit-cost terms (JASIS -Sept. '82).

When one looks at information technology and considers its implications for the individual and society, what emerges quite clearly is that the technology is here, while the social awareness concerning the impact of the technology and its potential in terms of performing tasks has not been given serious thought (Ibid).

Among other things, the attention has been focused on generating and transmitting information rather than on how information is used. The fact that information can be transmitted to a remote point does not mean that it can, should, or will be used. Our world is an information-rich world in which the problem of absorbing information is more acute than the problem of generating and transmitting it (Ibid).

The Library supports the transfer and use of information. Transfer services include the provision of documents through lending, photocopy, or other delivery methods. Utilization services include providing specific facts and information from the library's resources and searching bibliographic data bases to locate books and documents relevant to information questions (J. Med. Ed., Nov./Dec. '82).

Costs/Funding/Budgets. If the resources available to research libraries continue to move in consort with the resources available to universities generally, then the outlook for the next decade or more is for continued - and perhaps more severe - financial stringency. State university budgets tend to be enrollment-driven, while private institutions rely heavily on tuition payments; thus a leveling off or reduction in enrollments presages a leveling off or reduction in resources (Scholarly Communication).

Growing percentages of the library budget are going to supplies and related materials, reflecting in part rapid price increases in these categories, and also some budgetary shifts, under which purchased data-base access and document-delivery services are playing a more prominent role (Ibid).

Few libraries are keeping up with the expansion of publication in their own fields of interests, and most are falling behind. This is particularly true for monographic purchases in academic libraries, which continue to decline (Steig).

Recommendation

Establish a Development Office in the University Library system to work in partnership with the University's Office of Development and University Relations. A major responsibility of this Office will be to pursue grants through foundations, corporations, private donors, etc. in order to provide supplemental resources necessary to utilize information systems needed to support collection development.

Recommendation

A formal mechanism should be introduced to set standards for all libraries utilizing the Copyright Clearance Center, and specific guidelines should be published for their use.

DECENTRALIZED ACCESS TO INFORMATION

The role of the library in giving access to information without prescription is a value worth preserving. The tendency to instruct patrons in the skills with which they can help themselves instead of turning always to the library, may be a desirable aspect of our social contribution that we do not wish to change. The long held dedication to client rather than colleague-oriented goals, while not always successfully attained, has been an important orientation in librarianship and one to which some of the other professions are only now beginning to give serious attention. Client-orientation, special knowledge enlisted in the service of the people, and public benefit before private gain are professional goals to which librarians will continue to address themselves (Ashaim).

Scholars should have access to a comprehensive bibliographic system that allows them to identify and locate materials and to obtain them at a reasonable cost and without excessive delay. Without prompt access to important material contained in large library collections, users may miss significant items because of a sluggish retrieval process.

Recommendation

All libraries in the University Library System, in the next 3 years, should have 1) RLIN terminals installed, 2) literature searches (online searching) made available to patrons, and 3) the Campus Computer Network should be investigated by the Library administration, for potential use in the Library system.

USER EDUCATION

In the next decade there will be many changes in library services and in library use. Most of these changes will accelerate the trend away from each library being a self-contained unit and toward a system in which the library will be a service center capable of linking users to national bibliographic files and distant collections. As the scholars' survey and the Cline-Sinnott studies have shown, however, these new directions in library development will initially be resisted by many faculty members and other researchers who place great weight on local self sufficiency. It will be essential to the success and acceptance of the new approaches, therefore, for librarians on every campus to explain the reasons for the changes, the methods for using new services, and the benefits to be derived. In addition to the librarians' role faculty members also have a responsiblity to learn the new techniques for library usage and to pass this knowledge along to students (Scholarly Communication).

Academic and research librarians can profit by intensifying their existing efforts. Most colleges and universities have at least some program in bibliographic instruction. Through properly designed bibliographic instruction programs future scholars can learn to use information resources effectively. A bibliographic instruction session may also have unintended side effects; the faculty member who chooses to sit in while librarians provide such instruction to his or her class may pick up something useful for his or her own work (Steig).

The existence of library committees and the involvement of faculty with book selection provide other, less direct, opportunities to increase the scholar's understanding of the problems and potentials of libraries. Committees can be used as a forum; the book selection process presents many occasions for conveying information. Both develop personal contact, not a particularly innovative or exciting method, but one that can be extremely effective. Just knowing someone to turn to in an institution makes it less intimidating, and it must be remembered that for uninitiated users libraries can be very intimidating (Ibid).

At the beginning of each term, campus seminars may be useful with more attention paid to the techniques of library usage as a part of undergraduate and graduate education in all fields. Librarians must exercise leadership in bringing these issues to the fore, and must see library education as a growing part of their jobs (Scholarly Communication).

Recommendation

Campus-wide seminars or forums should be offered to University patrons in all disciplines to introduce them to the services of the University Library system. Faculty should be encouraged to participate in the presentations as moderators of panel discussions, participants in question/answer sessions and as speakers, etc.

USER ACCEPTANCE

The necessity for the librarian to act as an intermediary has been beneficial to the library because librarian and user have of necessity been talking in depth about research needs in a way that was perhaps not possible before. While it is necessary for the librarian to continue to act as an intermediary for the immediate future because of the relative low use of the new technology, this will not always be so. Eventually, it will be appropriate for users to assume this responsibility. This reinforces the librarian's role of providing total library service, (Stevenson).

Acceptance among users and an increase in their number will be slow while access is primarily to bibliographic data bases which retrieve references and not facts and numbers. As more numerical/factual data bases become available (particularly in the sciences), users will become more willing to make use of them (Ibid).

The major barrier to change is often not a love of the status quo but the lack of a clear picture of where technology will lead. The will and desire for action may exist; the financial resources may be available. Without a vision of the goal, and a concrete demonstration of feasibility, however, fruitful change is difficult to initiate (J. Med. Ed., Nov./Dec. '82).

What then does the future hold? Ultimately it will be what changes the users are prepared to accept that will determine where we go from here. What is possible and what is acceptable may well be very different. At present, the tendency is not to ask what developments the users want, but what are they going to be offered? This approach may not be any more successful for the new technologies than it was for the microform "revolution" that was heralded a few years ago (Stevenson).

By their natural inertia, some individuals and organizations in the library community will be opposed to the acceptance of cable services, videotex, online catalogs, automated information retrieval, and other video technologies simply because they represent change. But these innovations are technically feasible and are becoming economically viable; their increasing use appears inevitable (Harnish).

Recommendation

The University Library should assume the role of educator in making its users "computer literate" by assuring that the technological hardware and software and the library environment are "user friendly." It should advertise the practical applications and uses of various telecommunication equipment and solicit support from vendors, industry, and others in providing on site demonstrations.

ELECTRONIC PUBLISHING

DEFINITION

Articles on the subject of electronic publishing differ widely in their usage of the term "electronic publishing". One of the more expansive examples was a summary article in the June 4, 1982 issue of *Publishers Weekly* which included printed books about computers as an example of so-called electronic publishing. The chief emphasis in this report will be on electronic publishing in a more specialized sense. Except where otherwise stated the discussion will center on the dissemination of research information through integrated systems in which first drafts, reviewing, editing, distribution to readers, and the receipt of reader responses are all mediated by a complex of telecommunications facilities and computers.

EXAMPLES

Examples of the first generation of electronic publications are already at hand. The bibliographic data bases which are now used heavily for literature searching are the most obvious example, but there is also the case of the *Harvard Business Review*, whose full text from 1971 onward is now available under the auspices of John Wiley and Sons. Another new non-print "publication" is the *New York Review of Art*, whose monthly issues are in the form of videocassettes, featuring visits to art galleries and major new exhibits. These examples do not fully meet the specifications given above, since most of the data bases and *HBR* are spin-offs from long-established paper publications. However, they are interesting and instructive as illustrations of a transitional stage from paper to electronic publications and not all steps in the production of the New York Review of Art are based on telecommunications/computer connections. At the very least they have demonstrated the commercial viability and the usefulness to research of certain types of information in an online format. Further, they have taught some useful lessons in the application of computer technology to meeting the information needs of researchers. Finally this introductory stage has shown that libraries and librarians can play an important role as educators and interpreters of the new information technology.

The next generation of electronic publications is already advancing toward center stage. Perhaps the most comprehensive step-two experiment is the Electronic Information Exchange System, sponsored by the National Science Foundation and led by Murray Turoff. The EIES has developed four different electronic publications in the area of science and technology:

1. *Chimo*, a newsletter with items about EIES; it serves as a current awareness abstract and headline service.

2. A public conference called "Paper Fair", which is a totally unrefereed journal. Any member can submit a draft of a research paper, a chapter from a book in preparation, a grant proposal, or a book review. Any other member of the system can submit comments. In effect this subsystem is an electronic preprint exchange with the added capability of receiving and organizing reader feedback.

3. A complete, traditional, refereed journal. The EIES managers selected a research specialty known as "mental workload", which presently has no print-based journal. EIES was able to handle all of the following functions electronically:

a) An author writes and revises a paper in electronic form, using text-editing features.

b) He/she submits the paper to an editor.

c) The editor reads it and then sends it to the reviewers with the author's name deleted.

d) The reviewers, author, and editor discuss revisions.

e) When the paper has been revised and accepted for publication, an abstract is placed in a "Bulletin" where it is potentially available to thousands of readers. The readers also have the option of calling up the full text of the article.

f) All comments by readers are collected, along with the author's responses, and made available to all other readers.

4. A subscription called "Legitech", which generates a tailored, structured journal. The comments are limited to queries from participants and responses from other members. After some time a "brief" is prepared, integrating the original inquiry with all responses. The brief typically runs from 3 to 15 pages and is made available both online and in printed hard copy format. The core members of this subsystem are the science advisors to 25 state legislatures.

Of the four approaches outlined above, the least successful was the full-scale, refereed imitation of a traditional journal. Although prestigious members of the "mental workload" research community had promised to contribute articles, months went past before a single paper was submitted, and by the end of the trial period a grand total of two papers had been "published". In addition to several minor problems the EIES leaders attributed the journal's failure to two major difficulties. First, many potential contributors were deterred by a perceived lack of prestige in electronic publication. Secondly, an effort to internationalize the Mental Workload editorial board and group of contributors foundered; the British Post Office refused to allow British scientists to participate in EIES via TELENET, because such participation would violate the Post Office's agreement with Western Union International.

In addition to the government-backed experiments of EIES there are several examples of commercially-sponsored electronic publications in the field. One company which has raised a stir recently is Comtex Scientific Corporation, founded and headed by Frederick Plotkin. Comtex has announced that, beginning in late 1982, it will launch a succession of new electronic journals at the rate of one per month until it is publishing a total of 36 journals in sundry scientific fields. Initially, the journals are to be on microfiche only, but by early 1983 the journal contents should be in a central computer file to which subscribers will have access. A year's subscription to one of these journals will be in the range from $500 to $600. In another departure from common practice among scientific research journals, Comtext is offering to pay contributors $100 per article. Mr. Plotkin does not view these journals as being directly competitive with existing hard-copy journals because of the content; each issue of the Comtex publications will consist of one lengthy progress report.

Early reactions by editors of hard-copy journals were generally quite critical. Several expressed a concern that the editorial standards of the Comtex journals would be very lax and that the result would be an "electronic garbage heap". As of January, 1983, none of the Comtex publications had actually begun. When publication does commence the new journals will be marketed to libraries as well as to individuals and research groups.

Other examples of nascent electronic publications could be cited. However, those cited above should suffice to demonstrate the promise and some of the problems connected with electronic publishing.

ADVANTAGES

Seen as a communication method for academic researchers, electronic publishing offers several advantages over traditional paper publishing. One of the most obvious is greater speed throughout the publishing process. Submission of a research article to an editor, routing from the editor to a reviewer, returning of the reviewer's comments to the editor, and forwarding of the annotated draft back to the author can all be handled electronically with the transmission of data at each step occurring almost instantaneously.

As illustrated in the EIES experiments discussed above, electronic publishing offers great flexibility in format, and inventive users can imagine formats which are based on the special capabilities of computer systems, optical discs, and their interconnections. It is interesting to note that some of the innovative formats have thus far shown more promise of early success than have efforts to initiate full-fledged primary research journals in electronic format only.

Although electronic publishing has not at this point established a clear cost advantage over paper publishing, it is the assumption of nearly every commentator on the topic that the costs of publishing on paper, as well as postal fees, will continue to grow, whereas computing costs are expected to continue to decline. Beyond this rather generalized set of assumptions, most experts have not ventured to be specific about the extent of the cost differential at any time in the future.

Immediate accessibility to the ultimate users is another tempting promise of electronic publishing. To be sure, a researcher is at liberty even now to enter personal subscriptions (or subscriptions for his research group) to the research journals in his field. However, there are practical limits to the amount of acquisitions money and storage space an individual or a group of several researchers can devote to this sort of information gathering. Electronic publishing makes it feasible for a researcher to purchase and store only those articles or other "publications" he actually needs in his work. The notion of direct and comprehensive access also leads to the possibility that the researcher may no longer have any need to use the library and its staff as intermediaries; by his own efforts and own equipment, the researcher can bring all the information he needs directly into his office, laboratory, or home.

Libraries, as well as individuals, may benefit from the reduction in storage space made possible by electronic publishing. Despite the above depiction of a researcher totally independent of libraries, it is probable that libraries will have a role to play in connection with electronic publications. In addition to serving as public access points for retrieval of information from centralized computer files, libraries could also be the archives for holding and lending of videodiscs. According to a recent article, one optical disc could store 300,000 pages of information; this is surely a significant saving in space as compared to the traditional printed format.

One of the more dramatic departures from the confines of paper publication is the ability of an author working with the electronic format to revise his initial contribution repeatedly without the expense and difficulty involved with new editions of paper publications. A research article in an electronic journal might evolve over a period of months or even years, leaving behind no copy of the author's report as it originally appeared. A group of tables and related data which might once have been published as a handbook could in the future remain in electronic format only so that corrected, improved, or expanded data could be inserted in a continuing stream without the need to wait for years for a new "edition". Thus, a user could be assured that, at any given time, the data in the files were as up to date as today's research results.

DISADVANTAGES AND OBSTACLES

Authors' easy access to electronic publishing facilities, in particular the computer files that constitute the "publications", has led many observers to raise the issue of quality control. The refereed research journal has high prestige precisely because it is edited and refereed by peers of those submitting articles for publication. Even though the editing/refereeing process is responsible for a considerable fraction of the cost and slowness of traditional research journal publishing, it is tolerated because the resulting material has been validated by specialists and is presumed to meet reasonable standards of quality and signficance. Other types of publications on paper, such as technical reports and preprints, have been devised to lower cost and improve speed. Such quasi-publications, however, are not generally considered to be the equal of refereed publications in quality and prestige. Even though it is entirely possible to use the new electronic tools as support for a publication with all the traditional panoply of editors and referees, the fear is that the bulk of electronic publications may turn out to resemble preprints, where the only editing is that provided by the author himself.

Closely allied to the problem of perceived quality is the question of prestige. If electronic publications in general do not develop a reputation for high quality, their prestige in the academic community will inevitably be low. Given a lack of academic prestige contributions published in electronic formats would surely not be weighed very heavily in decisions on promotion, tenure, and salary merit raises for faculty members and researchers. To complete this potentially vicious circle, academic researchers would have little incentive to serve as editors and contributing authors when the rewards in prestige and related honors are likely to be low or nonexistent. It appears the pioneering effort of the EIES experimenters ran into such an impasse. One may venture to guess that the strongest, most prestigious scholarly and professional societies are in the best position to break the barricade and have their electronic publications accepted as valid in the academic community.

Although most paper publications of scholarly interest go out of print within a time period of a few months to a few years, researchers in North America can turn to their local research libraries for help in supplying either originals or photocopies of needed items. Unfortunately, the same libraries may not be able to perform fully the same archival function for electronic publications. Consider the following scenario. An electronic journal published by a commercial, for-profit firm is available in an online format only. Neither a video disc nor magnetic tape version is offered to libraries. Suppose further that after ten years the commercial publisher determines it is not profitable to keep more than the latest five years' worth of the journal online. Who is then responsible for storage of the "back file" and how can the publisher's cooperation in transfering the back file to the library be assured?

While many reports on electronic publishing assume that there are no remaining technical problems, there are several types of data that cannot be transmitted economically and with excellent quality in the available online systems. Photographs (especially those in color), tables, graphs, mathematical equations, and chemical formulas are items most difficult to handle at reasonable cost. Experts mentioning this problem area take it for granted that there will be substantial improvements over the next few years.

There exists a whole complex of legal, behavioral, and financial barriers to the rapid growth of electronic publishing. As discussed earlier, the British Post Office used its legal power to cripple an early experiment in electronic journal editing. Even aside from questions about quality control and prestige, it is likely that many currently practicing researchers will be slow to make the transition from paper publications to electronic publications. The experience of the microform industry has shown that the scholarly community can exhibit surprising inertia in its information-using habits; the speed and extent of change can be much less than is technologically feasible. The present publishing industry is yet another area where inertia is to be expected. With billions of dollars invested in the equipment required for paper publishing, even those established publishers most interested in electronic publishing will not be eager for an abrupt and complete move into the new medium. Again, an example from the microform business is instructive. Most microfilm publishing is still done on 35-mm film even though 16-mm film in cartridges is generally considered technically superior. According to the head of microforms for Pergamon Press, this is because most academic and public libraries committed themselves long ago to the equipment for 35-mm films and are now unable or unwilling to change.

Although it is not easy to provide systematic evidence on the subject, browsing in research journals is certainly regarded by some researchers as a vital aid in stimulating fresh thinking. Because machine-based approaches to scientific information—be they data base searches or uses of electronic journals—tend to be precisely specified and restricted, the role of serendipity may be suppressed.

Finally, the issue of copyright for information in computerized format could be crucial. Some observers are predicting that the traditional notion of copyright will fail in the face of electronic systems that enable readers to create variant versions of a published work. If this is so, some new basis for royalty payments to publishers will have to be found, or the incentive to publish in electronic format will be lacking. The importance of establishing ownership of information is emphasized by OCLC's recent move to copyright the OCLC database. Since the content of the database consists of cataloging records prepared (and sometimes modified) by thousands of individuals at many different institutions, the OCLC copyright claim may force an early resolution of some of the issues involved.

ISSUES AND CONCERNS FOR LIBRARIES

Is there a place for libraries as distributors of electronic publications? Considering the current picture, the answer is a cautious "yes". In part the opportunities for libraries will depend on the marketing strategy used by publishers. As already noted, Comtex Scientific, one of the more ambitious ventures presently in the field, will definitely be trying to sell its products to libraries; there is no prominent example of an electronic publication closed to library use.

Libraries therefore have a chance to define their role in distributing electronic publications before it is defined for them. They are free to establish themselves both as access points for online information and also as archives for electronic information transcribed onto optical disks or microforms. Likewise, libraries should be free to devote some of their acquisitions funds to paying for access to electronic publications. This will not be an easy decision to make especially when it is coupled with the question of who pays for access.

Many academic libraries, including the University of Michigan Library, impose user fees for online bibliographic database searching. Should this be regarded as a precedent for online original research publications, particularly those which have no hard copy equivalent?

Data base searching access via the library is constrained not only by user fees but also by the limits on availability of library staff searchers. Faculty and graduate student researchers in the sciences, some of whom now have after-hours access to library books and journals, may not appreciate a system that requires library staff intervention for access to electronic publications.

THREE VIEWPOINTS

In summary one can discern at least three different groups with distinctive perspecties on the emerging technology known as electronic publishing. The prospective publishers must be concerned that the new technology be cost effective, that color illustrations and other specialized data be handled satisfactorily, that some form of copyright protection be available, and that a profitable, marketable sales system be designed. Libraries and academic administrators are concerned with such problems as the affordability of electronic publications, the assurance of quality comparable to refereed paper journals, and the academic prestige of electronic publications when used as evidence for promotion and tenure decisions. Individual users will doubtless be concerned about the cost of electronic publications, their availability to researchers, and direct access via personal computers as opposed to access via libraries or other intermediate agents.

Recommendations

1. The University Library should assert an active role in storing and retrieving information in the new electronic formats, including online publications and data stored on videodiscs.

2. As they become available in various disciplines electronic journals should be subscribed to by the Library, using regular acquisitions funds as presently allocated to various selectors. In order to establish clearly the Library's role in offering electronic publications, selectors should be encouraged to initiate electronic publication subscriptions with less stringent quality standards than they may be using for paper publications.

3. Primary research publications in electronic formats should be offered without imposing user fees. This is particularly important when no paper equivalent is available.

4. The Library should arrange, if at all possible, for user access to electronic publications even when all the campus libraries are closed.

5. The Library should assume a leading role in publicizing electronic publications and teaching researchers how to use them.

NETWORKS

INTRODUCTION

The university's capacity for meeting the information needs of its faculty, staff, and students will be radically affected by the rapidly evolving electronic information environment. We are seeing a shift from paper to electronic formats in order to improve our ability to access information selectively and to manage the overload caused by the continuing expansion of knowledge. Doubling approximately every ten years, the world's knowledge is a conglomerate of uncoordinated, autonomous, incompatible information files. A network of interactive information files is essential in a collegial, information-intensive, and information-dependent environment. In this new era, the library as a center for academic information management services, not just a collection of books and resources, is potentially one of the university's most important units (Matheson, 1982).

Pivotal to any information transfer network is a unit that can bridge the world's knowledge and institutional information support systems. One of the first steps the university must take in the near future is to see that such a pivotal unit is in place and functioning. Academic executives and the faculty can exercise one of two options. They can help to redefine, retool, and reorient the traditional information-handling unit, the library, and give it the resources to develop the technological capacity and staffing to perform these essential functions. Alternately, they can create a new facility or adapt an existing unit to develop and manage academic information resources of the university. The first of these options is the least costly, the most efficient, and the most logical (Ibid).

Therefore, automating the operation and management of the library is a necessity not a panacea. The longer a university waits to build an information network system to support the research and teaching of its faculty, staff, and students, the greater disadvantage these individuals will experience in relation to colleagues and peers both now and in the future. Finding the necessary capital will be an unwelcome challenge of the 1980s. Aging physical plants, obsolete laboratory equipment, increased operating costs, and the soaring costs of information resources all compete for limited funds. Even so, a capital investment in modern technologies is crucial to survival in tomorrow's environment. Some financial resources may come from greater economies in the operation of existing facilities. Other resources could come from joint ventures with industry, foundations, and the government. But the greatest challenge to the academic community may be to accept responsibility for the management and control of its intellectual foundations and to identify the necessary leadership to move ahead (Matheson, 1982).

Finally, it is becoming increasingly important to integrate information management concepts into the educational process. A network system approach is an effective response to those needs. Unhampered by barriers of space and time, networks accommodate a collegial structure and allow individuals to build personal information files to support their research and teaching. Also, the network concept appears ideally suited to the academic organization because decentralized management of files permits maximum local autonomy and diversity. Planning should be initiated to identify key components and functional requirements of an institutional information network and to set priorities for network development (Matheson, 1982).

Recommendations

1. Establish a network capability by automating all managerial and operational functions of the library.

2. Use this capability to have the Library serve as the University's bridge to external bibliographic data bases.

3. Interface the Library's system with the other UM computer systems to optimize the transfer of information from external bibliographic data bases to users' local files.

4. Commit the University to educational programs that use and integrate these new information system capabilities.

SCENARIOS OF THE FUTURE

Portrayed in Matheson's report, the following scenarios describe how evolution of the present information-handling environment into more advanced stages might proceed. These scenarios, limited to the academic environment, follow the typical staging patterns: beginning with replacement technologies (doing the same thing better), proceeding to different ways of doing what was done before, and finally moving to a transformation stage.

STAGE 1: THE NEXT 5 TO 10 YEARS

There is a campus electronic mail system. Each department office is equipped with communicating word processors. Each building has telefacsimile equipment and/or closed circuit TV communication. Most faculty members and students own 8-bit, 16-bit, or 32-bit personal computers. All of the Library's records are online. Access to library materials may be in the usual way: dropping in and browsing. Alternatively, individuals may use any terminal to call up the Library from their office or home 24 hours a day to find out if the Library owns and has available needed materials. Requested materials may be delivered to a campus or home address. Individuals with personal microcomputers or electronic mail services can receive automatic status reports on their current library transactions, for example how many books are charged out and when they are due, status of a new book request, etc.

Using the terminal and a telephone or split screen conference system, an individual can communicate with the librarian for advice, instructions, or requests on data base searches. Librarians work with faculty to maintain course syllabi and reading lists online. Lists of faculty publications are compiled from data base searches and maintained in university files. Some faculty members' s research-in-progress is registered in a library data base. Librarians consult with individuals who want to set up personal data base profiles.

The library has access to the full range of available data bases and where it does not maintain its own searching expertise, it uses a consulting network of librarians and information systems. Materials can be transferred from a network library to an individual's files. Charges for services are managed through the University accounting system.

In Stage 1, the Library is primarily a modern resource library. Its functions are to acquire, house, organize, and make available resources that support and advance the mission of the University. It is an information transfer facility, securing desired information from wherever it is available and providing it to an individual organization.

Librarians instruct individuals in accessing and organizing information for future retrieval. The philosophy of access has changed: people do not need to go to the Library to secure materials or services, although they may.

STAGE 2: THE NEXT 10 to 20 YEARS

Word processing systems have voice recognition and voice input capabilities. The library is a smaller facility. It consists of collections of current books, journals, and media in traditional formats, but part of the collection is now stored on videodiscs. University libraries house older materials and transmit facsimile copies on request to any library or individual. Most scientific journals exist only in online form, but general purpose journals and review journals remain in paper form.

In the early part of Stage 2 libraries will access information through a local videodisc system rather than through remote centralized files. The primary journal continues to flourish and serve an indispensible archival function, but the problem of quality filtering remains. The information environment has become extremely complex and dense. Nearly all information sources are available for online searching and retrieval and require the use of many different strategies, vocabularies, and search protocols. A significant number of journals, bibliographic databases and 1,000 or more numeric and information files are only available online.

The library is a network hub. Decentralized information units employ librarians and information specialists. They have a significant and essential role. They are specialists in the use of multidisciplinary information files who use citation techniques and other concept-linking features to produce highly specialized and discriminating searches. They instruct students in the development of personal databases. They work with other faculty members to develop project-specific databases by sorting and re-formatting the information. These "knowledge bases" may in part replace conventional textbooks and handbooks. Research grows out of integrated information systems that connect data into interactive, inter-institutional networks. At this stage, the Library is an information management center.

STAGE 3: BEYOND THE NEXT 20 YEARS

Scenarios in an electronics-dominated environment are not all clear or certain. Generally, however, the world twenty years from now might resemble something not too radically different from today. Education may be largely individualized. Professionals may receive most of their new information through electronic media, and libraries may be less repositories than management systems for a variety of computer-stored files used to disseminate information. Researchers may work in groups irrespective of geographical location, linked together in their own network. New kinds of information professionals may be capable of matching resources with clients needs.

Satellite-mediated long-distance communications systems that permit two-way audiovisual and digital conferences may exist. Numerous new electronic intelligence systems eliminate the obstacles imposed by human memory. Some of these intelligence systems demonstrate something like common sense. Some futurists believe that we tend to underestimate what can be accomplished in one year and overestimate what can be accomplished in ten years. The constant in modern society is rapid change.

IMPACT OF NEW TECHNOLOGIES

Coordination seems particularly important when one looks at emerging technology. Perhaps the most significant point about this new technology is that after pulling the community toward large centralized facilities for ten to fifteen years, in order to use machines with accompanying economies of scale, it is now pushing toward decentralization. New and continuing development in several technological areas will greatly affect network configurations in the next decade. In some cases the potential is enormous, but remaining technical problems seem formidable, although with the quick pace of development, obstacles may suddenly disappear. While the characteristics of new technologies and their implications for networking can be described, numerous other factors, including the size and shape of our present commitments, will determine in what way and how quickly we use these technologies. The technology may move ahead faster than the community can harness it (Avram, 1980).

Computers

New network configurations have been made possible by developments in electronic circuitry, particularly the integrated circuit. Large Scale Integration (LSI) and its higher density replacement, Very Large Scale Integration (VLSI), have reduced the costs and radically reduced the size of modern computers (Avram, 1980). One dramatic example is the introduction of Hewlett-Packard's 32-bit microcomputer which is being marketed as a "desktop mainframe" (Toong, 1982). Because communication costs are now more expensive than computing logic and circuitry costs, more processing of data is being done locally or regionally. This is resulting in a decentralization of networking systems. Greatly improved reliability of LSI and VLSI over earlier units and connectors has made the expense of maintenance and inspection manageable in geographically distributed systems (Avram, 1980).

While compact 32-bit microcomputers are envisioned as powerful work stations in future distributed processing networks (Toong, 1982), some data files are so large that they currently require main frame computers. Great technological advances are being made with high-speed large computing systems too, notably by dividing up the operations through specialized processors. The most advanced efforts are called "fifth generation computers" where up to

16 processors working in parallel, each capable of running seven major tasks simultaneously, can be connected together to process at a rate of 160 million instructions per second. In addition to improving speed, computer designers are researching ways to make computers easier to use; able to understand and interpret inputs including recognition of individual voices, perform minimal thinking through inference, and mimic human experts (Cunningham, 1982). While not yet available at any U.S. university, fifth generation computers may become a partner in research by helping to solve environmental problems and for modelling complex systems in a variety of disciplines (Buzbee, 1982). What impact fifth generation computers will have on information systems, and the research process remains unclear (Manual, 1982).

Storage Technologies

Following the same trend as computers, storage technologies will continue to increase in capacity while decreasing in price. This will enable multi-million record databases to be cheaply copied and distributed. However, the rate of implementation will be dependent on the relationship between purchasing storage and the cost of transmitting data stored centrally. Videodiscs, specifically, will have a drastic impact on the future of library networking. One of the most innovative uses of the videodisc incorporates a keyboard control, a microprocessor, and a videodisc player. With this configuration the user virtually has a video database at his/her disposal. IBM, General Motors, Ford Motor Company, and a subsidiary of Pergammon Press have already started to use videodisc players connected to computers to store technical data, parts of catalogs, patent data, and tutorial programs. MIT has built a room of the future called Dataland. The viewer sits in a chair in front of a large screen which displays the total range of information available by logo or title. With joystick controls the viewer skims over the screen and zooms in on chosen areas of information. A computer, also controlled by the joystick, then extracts increasingly detailed information from the chosen disc data sources. The results are displayed either as still pictures or moving sequences on a monitor screen (Fox, 1982).

North American Philips has developed a byte-oriented optical digital disc which can currently store 2×10^{10} bytes of digital data and full-text images. Capacities of 2×10^{11} bytes have been demonstrated in the laboratory, and future capacities of 2×10^{12} bytes/disc have been projected. An optical digital disc pack of ten discs and a jukebox version of 1,000 discs can easily be envisioned in the foreseeable future. It would be possible to store 1.4 million 100 page documents in just one third of a 1,000 discs in an optical digital disc jukebox. While error rates are 1000 times higher in optical digital discs compared to magnetic discs, Philips has developed a Read after Write (DRAW) system which reads data directly after they are written. If a discrepancy occurs, data can be written in another area. With expected advances in coding development and error detection, the optical digital disc will probably replace microfilm for preservation of collections (Marsh, 1982).

Communication Technologies

Two modes of communication will dominate the library network environment in the future: fiber optics and satellites. Fiber optics will replace current circuits in areas with high population densities. Scheduled for completion in 1984, AT&T is installing a 611-mile, interference-free fiber optic network that will link exchanges in Washington, D.C., Philadelphia, New York, and Boston. AT&T wants to install a similar system that will link Los Angeles and Sacramento. In Canada, Saskatchewan Telecommunications plans to build a 1,988 mile system in the early 1980s (Williamson, 1981). Fiber optics offers the same potential for lowering communications costs that LSI has achieved for storage costs. While this could support centralization, it also offers the way for efficient decentralization of large data files. Because fiber optics can be used in telephone lines, information systems could be delivered directly to the home and bypass the library completely (Avram, 1980).

Satellites, on the other hand, will be utilized to provide high speed, bulk-data transfer between computers operating on distributed databases. Satellites can transmit up to six million bytes of information per second, some 100 times faster than the best quality land lines. At this rate, to transfer by the telecommunications system the content of a typical magnetic storage disc, it would take seven minutes by satellite, or thirteen hours by land lines (Marsh, 1981). Also, satellite transmission has two special advantages. The first is broadcast potential: each point in a network can essentially be connected to all other points simultaneously. This capability could facilitate the distribution of data while also serving to decentralize facilities. The second is capability for reaching remote areas. There remain several "rough areas" with satellite technology. Transmission time delay is a factor in interactive use. Error rates are high and require sophisticated retransmission/error correction techniques. Satellite transmission supports decentralization and new approaches to data collection and distribution, if solutions can be found to the error rate and if costs can be reduced (Avram, 1980).

EXAMPLES OF PROTOTYPE NETWORKS

Three types of networking systems exist: (1) system-to-library networks, (2) library-to-library networks, and (3) library-to-user networks. At present, these three network systems are discontinuous and heterogeneous. To link these networks, the library must be able to access system-to-library networks. From this will come the ability to participate and contribute to library-to-library networks and to accomplish the long term goal of linking the user to information through a multitude of systems. Some prototype library-to-user-networks will be briefly discussed below (Matheson, 1982).

CSNET

More than a decade after the Arpanet network was turned on by the Defense Advanced Research Project Agency, academia, under National Science Foundation sponsorship, has created the look-alike CSNET. Its goal: to provide networking services to the entire U.S. computer science community. Arpanet is a closed society limited to people who are working on Defense Department contracts. Those with an account on it have a link to the largest collection of computer hardware and, most importantly, scientists and researchers yet assembled. Members can exchange electronic mail, search each other's files, and run programs remotely. There are online journals and special interest groups. Now, computer scientists on U.S. campuses will have the same opportunities (Barney, 1982).

Expected to be fully operational by early 1983, CSNET has nearly 40 organizations online and over 70 applications have been received. In addition to university connections at Wisconsin, Purdue, Delaware, California at Berkeley, Princeton, Washington, and elsewhere, the network also includes industry members like Bell Laboratories, the Rand Corp., HP Laboratories, IBM Corp.'s research labs, Tectronix, and Fairchild Semiconductor's artificial intelligence research lab (Ibid).

Beyond its immediate impact of providing the computer science community with a powerful communication system, CSNET has implications for all disciplines. In order to operate at all, CSNET has had to develop software that transcends the technical barriers between existing networks and computer hardware. This software will be made available to any other group that wants to form its own network; and because all nets will use the same data paths, they will be linked to each other. Members of any future "Chemnet" or "Physnet" will be able to communicate freely not only with each other, but with people in other networks (Ibid).

Distributed Networks at Drexel, Clarkson, Stevens, and Carnegie-Mellon

First it was slide rules, then calculators, and now personal computers. Drexel University, Clarkson College of Technology, Stevens Institute of Technology, and Carnegie-Mellon University are requiring that each student own a personal computer (LJ/SLJ Hotline, 1982).

For example, at Clarkson College of Technology (Potsdam, NY), a school which emphasizes engineering, science, and management programs, its 1,000 freshmen are required to purchase personal computers for the Fall 1983 semester. Each student will pay $200 per semester plus a one-time deposit of $200 for a Zenith Data Systems Z-100 microcomputer which contains both the 8085 eight-bit and 8088 sixteen-bit Intel microprocessors, enabling it to run on software written for eight or sixteen bit systems. Upon graduation, the student will own the computer (Newman, 1982).

In a similar program begun this fall at Stevens Institute of Technology (Hoboken, NJ), all of the 80 or so freshmen in the science and systems planning and management curricula are required to have a personal computer. They are using the Atari 800 with 16K of random access memory which was chosen for its cost ($747) and its selection of peripherals. Students use the computer as a tool in their mathematics courses, during laboratory work, and as a terminal for the campus' mainframe (if the student purchases a modem) (Ibid).

In a program that goes beyond those announced by other schools, Carnegie-Mellon University (CMU) (Pittsburgh, PA), has selected IBM for a joint venture to develop an advanced personal computing network with more than one work station per student so students can access stations around the campus (Ibid).

Beginning in 1985, each entering freshmen student will receive a microcomputer to use while enrolled and working at CMU. Capabilities will include text editing, transmission of work to faculty members via internal communication networks, and access to schedules, assignments, tutorials, and library catalogs as well as standard problem-solving programs. These will be powerful processors, not toys. The objective is to produce a technology-literate college graduate without requiring a major in a technical subject (Matheson, 1982).

Under terms of the joint venture, IBM will develop all hardware for the project and will provide staff members to work with Carnegie-Mellon personnel at an Information Technology Center to be established on the campus to develop software for the network. The university chose a 32-bit work station with a virtual addressing range of up to one billion characters, an execution sweep of up to one million instructions per second, 500 kilobytes to one megabyte of main memory, and a high-resolution bit-mapped graphics display with both graphics tablet and keyboard input. Also among its proposed features will be the use of a totally new operating system environment where central file servers, instead of built-in disk storage located at each work station, will enable users to access files from any work station. A work station with such capabilities would cost about $20,000 on the open market today. However, the IBM unit is expected to cost about $6,000 by late 1985 when the university plans to begin installing units on the campus. Carnegie-Mellon eventually plans to hook up between 7,500 and 8,000 work stations. In the interim the university is evaluating several work stations, including one built by IBM Instruments division around a 16-bit Motorola 68000 processor and a bit-mapped graphics display (Iversen, 1982).

UMnet

Several networks already exist at the University of Michigan: Merit, the Computing Center, Data Systems Center, Hospital Data Systems Center, Human Genetics, the Computer and Image Processing Research Network (CIPRNET), the UM-Flint and Institute of Social Research Prime networks, each with their own system of terminals and devices. With the exception of Merit, most are "star" networks; they only allow connection of remote terminals and computers to a particular central facility. If the central computer in a star network fails, all of the attached devices are rendered useless. Merit connects five University computing facilities in the state of Michigan, and will soon add two more on the Ann Arbor campus (UM Computing Center Newsletter, 1982a).

In 1977 the University Committee on Computer Policy and Utilization produced a report recommending that the University of Michigan proceed with the development of "Hierarchical Computing." According to that report, the Computing Center, the Data Systems Center, and the Hospital Data Systems Center would each have a hierarchial computer network emanating from it. Subsequently, a Technical Subcommittee, appointed by the Vice President for Research, recommended that a single campus network be developed rather than having three separate hierarchical networks, thus shifting the emphasis from hierarchial to distributed computing. The Subcommittee further recommended that the Computing Center manage a task force to develop a detailed network design. A proposal for the network's implementation was submitted by the task force to the Vice President for Research in April 1981 (Ibid).

Although there is a great deal of information in various databases on campus as well as a number of specialized computing resources, people cannot easily use them. A Campus Computer Network, which would allow the use of widely distributed terminals to access various campus computing resources in the same way that terminals can now access MTS, would spur the growth of research in many areas and streamline the performance of administrative and instructional tasks. At this time, any University unit that wants to share data between computers must fend for itself; most start with little relevant experience, which results in considerable redundancy, loss of time and money, and produces varied success. Access to multiple computers from a single terminal and transfer of data with acceptable speed and error controls is not adequately implemented anywhere on campus (Ibid).

Certain units already share specialized resources. The Medical School and the College of Engineering formed the Computer and Image Processing Research Network (CIPRNET) and jointly obtained specialized image processing hardware. However, adequate access to this specialized equipment by projects needing it is still not available (Ibid).

Some research already makes extensive use of the microfiche capability at the Data Systems Center (DSC); in other cases data are extracted from DSC databases for processing elsewhere. Accomplishing these tasks generally involves ferrying tapes between the Computing Center and DSC, which is awkward for individual research projects too small to justify having a messenger (Ibid).

Stand-alone word processing stations in many offices on campus need to access specialized software and hardware services available at the Computing Center and/or the Data Systems Center, such as laser printers, computer output microfiche, or phototypesetters (Ibid).

Mini- and microcomputers should be able to communicate with the Amdahl at the Computing Center or other large computers. Specialized data analysis programs, program development facilities, and other specialized facilities, e.g., plotters and high-speed, high-quality printers are often useful to small computer users. Small computers could be used to prepare files, which would then be sent via the Campus Network to the desired host. However, all of the applications mentioned above depend upon data communications between large and small computers (Ibid).

In addition, mini- and microcomputers on campus should be able to communicate among themselves. Such communication would make it much easier for small computer users to share programs and facilities. For example, a number of microcomputers in a laboratory might share one or two printers, and programs developed on a computer in one part of the campus could be transferred easily to another computer elsewhere (Ibid).

Thus, a campus computer network (UMnet) would satisfy the needs outlined above since it would allow communication among a large number of heterogeneous terminal devices and computers. Local area networks, such as Ethernets would also be able to interface with UMnet. The network would allow many separate logical computer-user communication paths to exist simultaneously. Internally, the network may consist of computers, cables, microwave links, television links, or other sophisticated communication media. Computers attached to the network that provide services to network users are called host computers (Ibid).

The prototype must demonstrate the most important functional requirements needed to provide campus distributed computing. In addition, it should provide as much immediate relief to the units in need of network services as possible. Finally, it must be as cheap as possible. For this reason, previously purchased equipment will be used whenever possible, and new facilities must be selected carefully to serve campus needs (Ibid).

Both the Ann Arbor and the remote campuses of the UM will participate in the development of the prototype. The first development phase is divided into two parts, the prototype on the Ann Arbor campus to test networking techniques, and later, an extension to Flint and Dearborn (Ibid).

Five computers have been selected to become host computers on the prototype network: the Amdahl 470/V8 at the Computing Center, the IBM 3032 at the Data Systems Center, the Prime 750 at the Institute for Social Research, the VAX 11/780 in the CIPRNET, and the IBM 370/148 word processing system at the Computing Center. Each of these hosts will have its services significantly enhanced by being attached to UMnet. The MTS terminals and remote batch station at NUBS will also be attached to the network (Ibid).

The design outlined above was to be implemented over a three year period, and $400,000 was requested for the first year. Unfortunately, the proposal has not yet been funded at this level. A modest amount was made available to continue the task force, which is refining and updating plans for the network as well as implementing some of the less costly features of UMnet (Ibid).

Mailnet: Inter-University Electronic Mail Service

The Carnegie Corporation has approved funding for the pilot phase of a project that will link together local, campus-based electronic mail systems at colleges and universities. Called Mailnet, this joint effort of EDUCOM/EDUNET, the Massachusetts Institute of Technology (MIT), and 15 participating institutions including the University of Michigan will create a technically sound, intercampus electronic mail system for use by scholars, researchers, faculty, and administrators. With Mailnet, users will be able to exchange messages with other institutions using $MESSAGE. Hardware and software on MIT's central computing facility will act as a central switching mechanism for the transfer of messages between campuses (UM Computing Center, 1982b).

Dr. Fernando Corbato, Director of Computing and Telecommunications Resources at MIT, has defined the special role of the project for higher education: "Electronic mail, first pioneered within the computer science research community, has already enriched professional interactions independent of geography. Now, with the advent of Mailnet, it will be possible to see the same benefits extended to all scholarly fields."

In mid-1983 participation in Mailnet will be open to colleges and universities in the U.S., Canada, and overseas. EDUCOM will be responsible for management of the project, user documentation, and design and development of the operational structure for Mailnet as a self-sustaining activity. MIT will provide design and programming of the central system, maintenance and operation of computer facilities, and technical support of the system.

The other institutions involved in the Mailnet pilot project are: Harvard University, The University of Chicago, Swarthmore College, University of Wisconsin-Madison, Stanford University, Northwestern University, Rice University, Iowa State University, Carnegie-Mellon University, Stockholm University (Sweden), New Jersey Institute of Technology, Dickinson College, University of Southern California, and Cornell University.

OTHER COMPUTER-BASED DEVELOPMENTS

"USER:FORUM"

Available for more than three years, USER:FORUM is an online conference open to all users of MTS. Users are invited to join the FORUM by issuing the MTS command: $SOURCE USER:FORUM. The discussions have been wide-ranging and have included topics of interest to all MTS users from the novice to the expert. Recent topics discussed have included the relative merits of FORTRAN and Pascal, and Detroit area salaries for computer-related jobs.

UM Engineering/Transportation Library uses $MESSAGE System

The Engineering/Transportation Library is now answering questions about the library and its resources via the MTS Message System. Services for faculty and staff include: the ability to check out a book and have it delivered via messenger; submit or change a course reserve reading list; ask a question; and request a search, either within the library itself or on the various databases to which the library has access. In addition, certain general information will be available, such as a monthly new book list and a list of services and resources. Faculty indicating specific research interests can receive notification of new materials received within that area. Any course instructor may submit or change a course reserve list. Students and TA's are welcome to ask questions, but none of the other services will be provided via the message system (Holland, 1982).

PaperChase Retrieval System

Beth Israel Hospital in Boston has stripped the indexing for the five most recent years of the hospital's 250 journals from the MEDLARS computer tapes. This data base of about 400,000 items has been mounted on a local minicomputer for round-the-clock self-service access by faculty and students. The software system allows users to search the file using normal vocabulary. Search printouts are organized alphabetically by the journal title so the user can easily locate materials on the shelves (Matheson, 1982).

EVOLUTION OF COMPUTERIZED SYSTEMS FOR THE UM LIBRARIES (See Appendix I)

Perhaps the earliest continuing computerized procedure in the University Library was batch-mode updating of the Union List, initiated in 1961, and still in use today. Acquisitions functions were also handled by batch-mode beginning in 1965. Other early automation for the University of Michigan Library consisted of an IBM batch-processing circulation system for UGL reserves

(1967) and UGL and GL (1969). In 1975, circulation activities were based on an in-house microcomputer (Singer) which services the Graduate Library, Undergraduate Library, and Reserve Book Room. The system contained information only for materials charged out. Data were transmitted to the Data Systems Center (DSC), a UM computing facility, for processing five evenings a week; DSC then produced microfiche circulation listings as well as printed notices to patrons. Acquisition functions of ordering, fund accounting, and claiming items not received were handled by a batch system developed by DSC. Data were produced twice a week and an updated microfiche list of transactions was produced monthly. Management reports of serials data by fund were produced semi-annually (Dougherty, 1982a).

In 1972, the Medical Library began using the National Library of Medicine's (NLM) MEDLARS system. It is a computerized database searching the biomedical literature. The system produces a bibliography of primarily journal articles on a particular subject. It is printed offline and mailed to the library. In 1975, UM began using the literature search services of Lockheed and Systems Data Corporation (SDC).

Beginning in 1975 cataloging data were searched and edited in the OCLC bibliographic utility, a database comprised of Library of Congress and member-distributed records. The system was terminal-based (star network architecture), and transactions were performed online. Catalog cards and member archive tapes were produced by the network (Dougherty, 1982a).

In 1979, UM joined the Research Libraries Group (RLG) and began using Research Libraries Information Network (RLIN), its online bibliographic utility. In 1980, an online message system to transmit interlibrary loan requests was added to the system. Similar to previous use of OCLC, cataloging data were used from LC and member records. In addition, maintenance functions, i.e. updating records with information such as withdrawals, entry changes, added copies, etc., were conducted online to keep UM's database current. Catalog cards and archive tapes were produced by RLIN. Unlike OCLC, the RLIN system allowed online access to individual library records and provided more flexible searching capabilities including Boolean logic. As cataloging via RLIN was phased in, the inputting of catalog data to OCLC was stopped. (Dougherty, 1982a).

In 1981, RLG brought up the acquisitions module for RLIN. The system allowed for the modification of cataloging records to create acquisitions records and vice versa. This inclusion of acquisitions information in the database supported RLG's cooperative collection development program. The UM continued to use DSC for some of its orders and for all accounting purposes, since the RLIN system does not yet include a fiscal control component. An A. B. Dick microcomputer was purchased for administrative data (Dougherty, 1982a).

In 1982, the GEAC minicomputer-based circulation system was acquired to be used initially for the Graduate, Undergraduate, Medical, Engineering/Transportation, Natural Science Libraries and the University Reserve Service. Unlike the data file in the Singer System, information is provided for all items which have been entered into the database, not just those items absent from the shelves. RLIN and OCLC records are loaded into GEAC to be used for data conversion of circulation transactions. RLIN tapes will continue to be systematically loaded into GEAC to build the database. All circulation transactions, updates of patron information, and maintenance of bibliographic data will be performed online. GEAC will be expanded to include inventory control, i.e. the ability to keep track of an item's status from the point of acquisition. Items destined for storage will gradually be input. Volumes which are in need of preservation or repair will be noted in the system as well. Tapes for all Michigan items cataloged previously in OCLC will be added to the RLIN database. Also in 1982, Michigan signed a contract with BRS for literature searching at discount rates. (Dougherty, 1982)

Innovative Interfaces, a microcomputer-based system, with the ability to draw bibliographic data from RLIN, was acquired initially to handle serial orders and fund accounting for all materials. DOC was phased out and RLIN was used for monograph orders. RLIN instituted an interlibrary loan system which included the ability to link the bibliographic data with the message transmission function, allowing requests to be created without re-keying the title-specific information (Dougherty, 1982a).

In 1983-84, GEAC will be extended to additional divisional libraries. RLIN/GEAC interfaces will allow RLIN cataloging data to be input automatically into GEAC. Innovative Interfaces will take over the majority of ordering functions; those orders which have an impact on RLG's cooperative collection development program (expensive sets and serials, microforms, and areas of Primary Collection Responsibility) will be input into RLIN. Collection Development Statements for all RLIN members will at that point be available online. As a tapeloading member of OCLC, UM will load its RLIN tapes into OCLC once that capability becomes available (Dougherty, 1982). Both Lockheed and BRS will have document delivery for both printed and a few electronic publications. For electronic publications, a vendor will send the requestor a paper copy or "down-load," i.e. transmit the information from their computer to the users'. BIOSIS, a biological database, will offer output on floppy disc.

By 1986, an in-house local computer will integrate all functions, utilizing a two-way technical linkage with RLIN to transfer cataloging records from the network to the local system for manipulation and data base maintenance. System software will allow all processes for a title to be tied to the same record which can be updated as the status of the item changes. Conversely, local catalog information will also be supplied to RLIN to support RLG cooperative programs. A similar technical link between OCLC and RLIN will allow the two networks to exchange bibliographic data. Patron access terminals for the online system will allow the card catalog to be "closed" and no further additions made (Dougherty, 1982). Document delivery will be available through such vendors as Lockheed and Adonis.

IMPACT OF NETWORKS ON LIBRARIES

While it is almost an axiom that no single library can provide all the materials of potential interest to its users, librarians and faculty have not always been willing to acknowledge this in the operation of their institutions. Of all the reasons offered for entering into cooperative programs — increased quantity and cost of current publications, increased demands by users for materials difficult and expensive to locate, lack of storage space for continuing collection growth at the present rate, and recognition of the fact that valuable materials already in libraries cannot be preserved without special efforts — the most convincing argument seems to be a limited budget (Magrill, 1978).

The acquisitions activity of any library is a delicate exercise in balancing available funds against a relevant portion of available materials required to meet the needs of a particular library's constituency. It is pragmatic, philosophical, and to a large extent one of the basic tasks that librarians face. It is not clear whether the problem becomes simpler or more complex when it is shared among a number of libraries. It is simpler to the extent that the choices can be spread out among a number of libraries, thus minimizing the errors of omission. It is more complex in that the efforts require coordination and planning. Yet cooperative acquisitions programs are essential, not only at the national level but at local and regional levels, if we are to achieve effective resource sharing (Kronick, 1982).

The current focus on library cooperation utilizing networks has been stimulated by the growing capabilities of computer technology and declining financial resources available to libraries. No longer can anyone seriously question the central role technology will play as there is a growing realization that research libraries must adopt new strategies for conducting operations if they are to continue meeting their traditional institutional goals. Our success in employing these new strategies is dependent to a great extent on our ability to cooperate, and it is the economic forces buffeting libraries which present the compelling mandate for cooperation (Dougherty, 1982b).

A decade ago most university libraries joining OCLC did so in order to benefit from the economies of shared, computer-based cataloging. They were looking for the means to accomplish a specific job more cheaply. Gradually, libraries began to rely on OCLC's data base as a vehicle for obtaining information about library materials they did not own locally (Ibid).

As librarians gained experience in the use of computer-based networks, they began to understand how these systems might be used to support programs such as collection development and preservation. In fact, the formation of the RLG in 1974 was intended to use computer technology to support a range of library activities beyond cataloging and searching functions. The RLG membership undertook to address collectively their mutual concerns: collection management and development, including specific subject areas with special needs (art, music, law, East Asia studies); preservation; and resource sharing (Ibid).

Early planning for RLG included a study which recommended common procedures for interlibrary loan, photocopy and access to special collections; wide involvement with staff members in planning and review of consortium programs; the establishment of a bibliographic center; assignment of responsibilities for intensive collection development; coordination of expensive purchases and new serials acquisition; and cooperation in conservation and preservation of holdings. By 1975, a serials task force and committees on collection development and preservation were operating in the area of collection coordination and planning. Since serial publications always offer an attractive starting point for special agreements, early efforts have been initiated by RLG in this area. Other categories of materials identified for possible future programs of cooperative acquisition include those in "exotic" languages; nontrade publications; materials in nonbook formats (e.g. maps, magnetic tapes); and those requiring special acquisition procedures or arrangements to obtain (Magrill, 1978).

The Shared Collection and shared resource programs of RLG are an important effort toward achieving effective resource sharing. The RLG libraries are actively involved in preparing analyses of individual collections with the intent of assigning specific acquisition responsibilities (Kronick, 1982). The results of these analyses are being stored in a special RLG database called the RLG Conspectus Online. The database can be used for comparing and analyzing existing collections, for outlining future collecting policies, and for identifying designated primary collecting responsibilities among member libraries. Of potential use to interlibrary loan librarians, searching the Conspectus can help locate strong collections in specific fields. Researchers might also use the Conspectus to decide which institutions would best support their research efforts (UM Library Newsletter, 1982).

RLG members have now evaluated over 75 percent of their collections and assigned over 150 primary collecting responsibilities throughout the membership. Members will be able to use Conspectus data to compare their collections locally, regionally, and nationally, and to pinpoint unique national resources. Eventually, Conspectus data combined with other fiscal information will assist universities in reallocating resources to serve many fields of scholarship in a more orderly and cost-effective manner (University of Michigan Library Newsletter, 1982).

A coordinated collection development program should begin by reaffirming the primacy of the local collections. There is a singular significance to the local collections in comparison to materials at a distance from the user, however bibliographically accessible these may be. The network can help make these materials readily available to those who need them. However, it must be recognised that, with the limitations of the bibliographical devices available to us, these materials cannot play the same role in motivating research and defining the direction and quality of research as do local collections. The intermediaries of bibliographic access do not provide the intimate interaction necessary for this. We must gain greater understanding of user needs in this respect, and above all not take the stance that accessibility is equivalent to local availability. We must not allow our enthusiasm for resource sharing to obscure real and legitimate user needs (Hewitt, 1977).

Several collection development studies have shown that overlap or duplication is not as prevalent as might be anticipated, and that the problem may be more of coverage, or "underlap" as it has been called (Kronick, 1982). Some feel that while coordination of collection development might be appropriate for serials, it is probably not for monographs. In order to make resource sharing successful, libraries will have to explore the possible benefits, costs, and disadvantages carefully (Reed, 1978).

COLLECTION CONTROL VS. COLLECTION MANAGEMENT

A major goal of library automation today should be to improve collection control and collection management. Collection control is defined as the location and status at all times (not just during circulation). Collection management, on the other hand, is the management of library activities relating to the collection such as selection and acquisition, weeding, binding, shelving, etc. No longer is it justifiable to automate circulation functions without attention to the broader aspects of collection management and control (Goldstein, 1982).

The key to determining item availability is an accurate, current and easily accessible record of the location and status of the item. The impediments to maintaining simultaneously accuracy, currency, and easy accessibility of records in a manual system are so many, and the implicit processes so labor-intensive, that collection control is not likely to be achieved without automation. Some factors have, for the same reasons, not even been considered in manual systems. Central to any collection control system will be a record containing location and status information on every item in the collection. Locations to be tracked should include: patron, shelf location, temporary location of items, department or branch, interlibrary loan "patrons", bindery, and on-order file. The above location and status information can be achieved through the integration of all functions within one system and the integration of one master bibliographic file (Ibid).

One of the greatest benefits of an integrated library system (ILS) will be in the area of improved collection management. Both the present need and the potential benefit are greatest in this area. Some of the most salient ILS features relating to decision support, and hence collection management, are serials, the shelving function, and usage statistics. Additional features still in process or planned include: patron catalog access, portable data entry terminals, and system network access. Furthermore, acquisition policies in libraries are usually based on some measure of subject relatedness and are further refined through actual usage. Weeding policies could also be more effectively guided by the usage rates if accurate "in library use" data could be obtained. Finally, better binding practices would result if time and priority of binding are based on item demand (Ibid).

Or, for example, serials control in the future might utilise a combination of local and network online services. Emphasising cost-effectiveness, local online services would be used whenever possible. They would include: check in, routing, binding control, order and renewal, claim generation, etc. Network functions would include inquiry against central periodical and standing order master files, new title alerting, title change information, and claims handling (LJ/SLJ Hotline, 1982b). Additional features might include Library-controlled vendor selection along with a directory of vendor's addresses (Armbruster, 1981).

Management Information for Collection Development

Management information systems will provide collection development information to improve budget planning, allocation, material selection, and collection evaluation. Detailed collection development information should relate what is currently available in the library, what is being acquired, and what might be acquired to perceived need for library materials supporting teaching and research (Bailby, 1979).

Need should be estimated for institutional data on teaching and research, and eventually on studies of document delivery and library user satisfaction. The factors studied to date are library acquisitions, library extant collections, publishing output, and institutional academic programs (Ibid).

There are three primary units used to analyse collection development information data: individual titles, total library collection, and subject or disciplines. Individual title analysis is useful in collection overlap studies and weeding decisions where the circulation records are used to determine which titles may be discarded or relegated to storage. Descriptive analyses of total collections are interesting but are not very useful in predicting what will be used or in modifying collection patterns to improve the usefulness of the collection. Analysis by subject, on the other hand, has demonstrated the capability of predicting future use by subject. The subject data fall into two basic formats: (1) bibliographic data, and (2) academic program data (Ibid).

Recommendations

1. Utilise information regarding the number of courses, course enrollment, number of students and faculty, size of subject collection, publishing statistics, expenditure analysis, and use on a computer-based system to improve collection management.

2. Librarians should determine any additional variables which would be helpful in a management information system for collection development.

DATABASE QUALITY AND CONTENT

Quality control of databases is difficult enough under the controlled environment of major producers such as Chemical Abstracts Service, R.R. Bowker Company, or Library of Congress (LC). Uncertainty increases with every new member of any stored network. WLN addressed this problem in its software design. Other networks and LC rely largely on reports from the field and subsequent correction, a remedial and expensive procedure, coupled with extensive education and awareness among participants. OCLC reports that more than 45,000 error report corrections were made by its central quality control group in 1980 (Evans, 1981).

Unfortunately, to date there is no coherent theory of the economic or bibliographic aspects of maintaining quality control in a decentralised bibliographic database. Factors which can affect quality control are as diverse as economics, investment patterns, authority, error correction, personnel, assignment of roles among agencies, standardisation, and sanction and reward procedures, but they are barely addressed under the pressure of remediation, let alone answered (Ibid).

COMPETITION AMONG LIBRARY NETWORKS

In assessing the evolution and operation of OCLC, RLIN, UTLAS, and WLN, it is useful to make comparisons drawn from business. The business context is particularly appropriate since the emerging computerized library networks, while non-profit, are indeed businesses, run by highly entrepreneurial librarians who are concerned with market issues, e.g. economies of scale, market segmentation, diversification and new product development. WLN is competing with OCLC by offering a transportable software system; RLIN is focusing on developing databases for specific customer groups; and UTLAS is providing centralized processing of bibliographic data for individual customers as well as creating software for local use. In the future, these and other networks, e.g., perhaps discipline-oriented library networks, will be competing and/or cooperating with one another. How will these relationships change as we merge into a national network? Currently, for example, RLG is cooperating with WLN on an authority control project funded by CLR, while UTLAS is competing with WLN for customers in the Pacific Northwest (Robinson, 1980).

RLG professes not to be competing with OCLC. By luring away a number of OCLC's large research libraries, however, RLG has caused concern about the future effect on the OCLC data base and on the flow of revenue to OCLC and its affected service centers. As a consequence of these conversions to the RLIN system, a number of OCLC service centers have lost a few OCLC customers, although, to date, all defectors have maintained their memberships in their respective service centers. In lean economic conditions and a finite market base, it is not impossible that networks could become financially unstable and be merged into other networks. What would happen to a library's records if the network went bankrupt? These and many other legal issues concerning networks remain for libraries to address (Ibid).

NEW TRENDS IN NETWORKING

There are many new trends in computerized library networking; due to space limitations it is only possible to mention a few (Information Systems Consultants, 1981; ARL Newsletter, 1982; Epstein, 1980; Markuson, 1980).

1. There will be a continual array of new services and product offerings e.g. electronic mail; interfaces with bibliographic databases, online circulation systems and other networks; serials control; accession lists; online documentation and help; online training modules such as computer-assisted instruction; text editing; word processing; management services; special reports; and electronic teleconferencing.

2. Many of these offerings will have a significant impact on the services offered by libraries and the form of these services. The impact of patron touch terminals and online catalogs are two examples.

3. Vendors of a particular service, such as circulation and cataloging, will expand their services to other areas with high overlap or services between vendors of different services. For example, "circulation" vendors now offer ILL networking, online cataloging, and retrospective conversion. "Cataloging" networks now offer ILL and retrospective conversion and are planning to offer various forms of circulation services.

4. Vendors of different services are building interfaces between their services, sometimes creating new services.

5. Interfaces of stand-alone systems into "subnetworks", which in turn will become larger networks and eventually part of the "national network", will continue throughout the 1980's.

6. Online vendors are considering offering services normally considered stand-alone, such as circulation, serials check-in, local online catalogs, and regional ILL. These services would be part of a distributed network with local or regional files, yet be connected to the central host computer and files.

7. Planning of network services among users will improve as more clearly defined and technically reasonable requirements, schedules, and priorities are generated and documented. Several service centers and individual states are developing long-range plans with associated budgets to provide specific services, products and interfaces.

8. As technology continues to improve in power and decrease in cost there will be additional activities supported at the regional and local library levels. These activities will in effect be transferred from the centralized cataloging services to the local distributed network system.

9. The "national database" will not be a single database but rather a highly distributed and hierarchical network of databases. Detailed data of local interest such as circulation or an online catalog, will be maintained locally. Regional databases will maintain a summary of local library data sufficient to provide regional services such as interlibrary loan.

ACCESS TO MULTIPLE DATA BASES, AN UNMET NEED

In all current operational networks the user must learn the search language and search strategy of any service to be utilized. To use multiple data bases requires training in all of the systems plus the ability to remember the rules, languages, and other facets without applying the transactions to the wrong system. Reference searchers are familiar with this problem area, since some reference searchers are frequently called upon to search six to eight data bases, each somewhat different. As data bases proliferate, there will be an increased need for data base standardization. In a study of 24 databases on Dialog, there were 31 access points that overlapped, while 101 access points were unique for a particular database (Kasselman, 1982).

With some form of augmented user interface, a trained OCLC user wishing to use Lockheed, or a trained National Library of Medicine user wishing to search a circulation file, would be able to express the request in the original language, perhaps respond to some additional questions presented as part of the new interface, and wait for the results (Epstein, 1980).

Current research in the area of augmented user interface is exploring many different aspects and approaches to solving this problem. One approach is to develop a natural language interface where the computer attempts to understand the use of "plain" English including disciplinary jargon, conversational ellipsis, and incomplete sentences (Epstein, 1980).

Another approach is to present the user with a menu to fill out and, based on the results of one menu, choose the next menu until enough information is available to select the appropriate database, provide the selected host with the proper search terms, get in an interactive mode (or let the user participate in the interactive responses), and display the results. The results could be matched against the local library's holdings and printed next to each citation (e.g. call number and status of item) (Epstein, 1980).

One experimental system on a microcomputer at the Massachusetts Institute of Technology (MIT) can interface with several value-added-networks (VAN), e.g. Telenet; search service hosts; and individual databases by dialing up and logging onto the VAN and the host and selecting the proper database. Another less complex system at an abstracting and indexing service can interface with a single VAN and one search service, including log-on and selection of a single database (from those database suppliers that permit the receipt of machine-readable output), perform the search, collect all the search results, and log off the system. The system then presents the search results to the user for review. The user eventually should be able to select and reject records (from the set of previously recorded records) and format the final results for display or printing (Epstein, 1980). In addition, because automated logon and input of search strategies take less time they cost less (Burnam, 1982). Thus, automated logon and search input could result in significant savings in data base search costs.

It is entirely possible that a combination of approaches will evolve as the most practical and effective improvement in the interface to multiple data base network services (Epstein, 1980).

THE NATIONAL NETWORK

In the last few years progress toward creating a nation-wide network has been modest yet paradoxically at the same time quite impressive. In discussing networking among libraries, one must remember that the United States networking community is extremely pluralistic in composition. The community is diverse and it is rare when one can achieve general agreement on a substantive issue. Moreover, the public (non-profit) and private (profit) sectors do not agree on most policy issues concerning the economics of information. Competing interests exist and there is a constant worry among librarians concerning ownership and control of information and the power associated with such control. Consequently, in view of the complex social and political environment in the U.S., the progress over the last decade has been quite remarkable (Dougherty, 1982b).

LC's Network Advisory Committee met in March 1980 and identified six key issues in the creation, production and utilization of a national bibliographic database: (1) ownership of bibliographic records; (2) ownership of machine-readable bibliographic records; (3) access to and use of bibliographic records; (4) the economic incentive for creating bibliographic records; (5) fair compensation for their use; and (6) the lack of a mechanism to share bibliographic data on a national scale (Dougherty, 1980).

In fact, challenging problems exist at every stage of transforming a national network into operational reality. Beyond the problems of selecting workable mixes of network members, there are research problems as a basis for network planning, for transfering a prototype into an innovation in which entrepreneurs will invest, and for network construction. Numerous decisions must be made. Many require difficult trades among conflicting desiderata. The problems range from what resembles the balance-of-payments problem, to how much to distribute or decentralize, to questions of motivation, trust, bias, and communication. The routine control and maintenance of an operational network, as well as procedures for trouble-shooting and continual evaluation, revision, and regulation, require a systematic foundation. This will require the development of a new type of network specialist (Kochen, 1982).

Will the nodes of a library network be the cataloging, reference, and circulation departments of the member libraries? If so, will we lose perspective on the disciplines we are trying to serve? At minimum there need to be user groups formed to represent the concerns of the different disciplines (Ibid).

Maintaining a national network will be difficult because it will be an extraordinary, complex information system. Second, control will be elusive because of the diversity of component groups, each with their own goals and interest. Many of its capabilities will be a function of its use of rapidly changing information technology. As users begin to drive the network, their expectations will increase dramatically, and the success of the network will be a direct result of its capability to adapt to technological change. The management must be skilled in incorporating new technologies into existing services, perceiving new services that can be offered as a result of this capability, and accomplishing those changes with comprehension of the results they have on the network as a whole. Last, but most important, the real business is to increase the effectiveness of the use of information in this society (Shaw, 1982).

CONCLUSION

We will probably experience a redistribution of functions performed by the large national bibliographic utilities and activities performed at the local level. This redistribution is likely to be painful as organizations realign operations and staffing patterns to conform to new organizational structures. But underlying the technological upheaval is the still unrecognized imperative that research libraries must collaborate if they are to fulfill their traditional mission to support teaching, research, and scholarship. Research libraries will have to work together to minimize the financial problems that are likely to persist through the decade of the eighties. This will involve the recognition of local inadequacies and the necessity to participate selectively in programs of collaboration. Only if research libraries act collectively to address the dual problems of collection development and preservation will they be able to sustain traditional levels of service during this period of dwindling institutional resources (Dougherty, 1982).

IMPACT ON LIBRARIES AND STAFF

THE CHANGING LIBRARY AND ITS COLLECTIONS

The question of the survivability of librarians and research libraries is testimony to the existence of the information revolution. During the 1980's, librarians will experience rapid change and stressful work environments. The major catalyst is the ongoing introduction of technology into library operations and services. This change requires staff to evaluate and modify current job tasks and skills, information services, and organizational structures.

Within academic research libraries, the basic activities of the library staff will not change during the 1980's. Management of staff, selection of information sources, indexing and organization of materials, and management of information services will continue. What will change are the staff skills needed to accomplish the work, the allocation of resources to accomplish these basic activities, the environment in which they are performed, and increased direct user access to information published in electronic formats.

In the near future, research libraries may be evaluated on the array of information services and staff instead of the size of collections as the most important measure of quality and value to the scholarly community. Access to and not ownership of information resources is becoming the keystone of collection development as evidenced by the renewed committment to resource sharing, cooperative collection development, and preservation among the members of the Research Libraries Group. This message was echoed by M. L. Line of the British Library Lending Division in his speech at the Aslib Conference on New Approaches to Document Delivery. As reported in the January 1982 issue of Outlook on Research Libraries "...rising cost of journals is forcing many libraries to move from a 'holding' strategy in which pride in breadth of holdings is replaced by pride in speed of acquisition on demand".

Librarians Role

As cooperative programs develop and the electronic library becomes a reality, access to information will not be limited to what is available in Ann Arbor and acquiring large book and journal collections will become less important. The importance of the library as a warehouse of books and journals will decline and the librarian as information specialist will rise. The librarian's knowledge of information sources and services will take on new importance as the choices for users increase. For example, when individuals can not find information in the online files and other sources which they use regularly they will turn to the library as they do now for help. The librarian will recommend the appropriate source for the user to search or conduct the search for the faculty or student if the user is unfamiliar with the recommended source.

The rapid growth of electronic databases in number and diversity will require librarians to increase their knowledge of these resources in order to assist users in selecting appropriate online information sources. New and old information sources published in paper and microform formats will still be important in most disciplines for the forseeable future. There is a voluminous amount of information published throughout the centuries not available in electronic formats which users in academic environments will continue to need assistance in using effectively.

Difference among libraries and library services will result and less commonality among the library staffs and the public services offered will be visible in the short-term. Librarians may work in and directly with academic departments in greater numbers. The clinical librarian in the medical field and special librarians in business and industry are existing examples. Even now there are different library services offered throughout the University Library system. For example not all libraries provide an online search service or have access to the RLIN database. And in the near future not all libraries will offer electronic journals to their readers. These differences must be recognised by the organization and taken into consideration in its planning process and resource allocation.

Academic librarians will have a continuing role as long as they are important in the support of the intellectual process and communication of ideas and information.

Extension of Library Resources

Within this decade both librarians and users will be able to conduct many library activities outside the confines of the library buildings. Currently librarians and other information seekers can access online databases using computer terminals and telephones without regard to physical location. The rapid assimilation of microcomputers into the learning environment will encourage if not demand direct user access to electronic information.

In the Fall of 1982, both Bibliographic Retrieval Services (BRS) and Lockheed Systems, Inc. began to market directly to the public computer databases with reduced prices, simplified search language, and no offline printing. In November of 1982, BRS unveiled its MIRS (Medical Information Retrieval Service) project at the Sixth Annual Conference on the Applications of Computers in Medical Care in Washington. MIRS is a fully integrated information system which uses a video disk coupled to a microcomputer/terminal to allow users to carry out fulltext searches of relevant material, and link these to the illustrations, graphics and tables stored on the video disk. The initial buyer is envisaged as the physician or possibly the emergency room doctor and the initial contents consists of a number of textbooks.

This kind of information package will soar in number and will present to libraries another collection development format issue to resolve.

Library Personnel

What will be different for managers of research libraries in the 1980's? One significant difference will be the supervision of a very diversified library staff. Today's library requires new personnel such as programmers, information consultants, and technologists to maintain equipment. In this new environment, some staff will have the "interesting" jobs while others will be relegated to mundane jobs designed to keep the system operational. Others will leave because they lack the necessary skills to perform or find the workplace unappealing. The market is shrinking for employees with only traditionalist credentials or who want to maintain the status quo.

Computer literacy will be necessary for all staff. Currently most technical services and many public services staff use computer terminals in their daily work. Supervisors need to keep abreast of new developments if they are to manage electronic library staff and evaluate their work. The Library's responsibility to re-train staff must be taken seriously if staff are to be able to perform in and compete for new positions created as a result of the on-going introduction of new technology. The commitment to staff development must consume a larger share of the budget and staff time of the Library wants to maintain the value of its present human resources.

Decision Making Process

The Library of Congress experience indicates that 70% of all staff involved in the development of a new system remains with the project to keep the program working and respond to user experience. If this experience is even partially transferable, it could result in staff displacement and bring new individuals into places of power who may not have any background in the historical library services, operations, informaton sources, and bibliographic control or share in traditional library values. This personnel change could impact our planning process, question past values and disturb the stability of the organization's decision making process.

New personnel is not the only factor that could impact decision-making. During periods of change, available data including experience and historical values as well as data collected specific to the problem under discussion need to be considered. In the absence of hard data, the tendency is to turn to the most experienced or authoritative individuals. However, experience alone is not necessarily the soundest basis for decision-making in new areas of development.

OPERATIONS ANALYSIS

One thing librarians have learned is that new technologies usually should not be introduced with the expectation that they can be super-imposed onto the present operations without modification of present operations. In fact electronic processing may slow down processing if it is merely used to support or continue the status quo. An example of this can be studied within the Cataloging Department.

Since the founding of University Library, cataloging copy has been produced using pen and ink, the typewriter and now computers. After OCLC was introduced, it became quickly apparent that the existing work-flow was not efficient using that new technology. The labor-intensive practice of moving a book through pre-catalog searching, descriptive cataloging, and subject classification, and accessing the computer terminals and records during each stage was inefficient. This over-simplified example demanded an analysis of procedures which impeded productivity. Therefore the staff analysed in greater detail than ever before the processes necessary to catalog a book and how best to organize the staff and work to take advantage of the new computer technology.

Issues other than organization of staff and work-flow will surface. An example of this has occured in planning for the online catalog and processing of materials expeditiously. The question under discussion is what data elements or access points are important to include in the cataloging record. This question in turn has separate issues as well to study. Namely, is authority control, establishing names in a consistent form, important? Since there are good arguments on both sides, there is no clear and easy answer.

Similar analysis is on-going throughout the Library as new technologies are introduced into library operations and services. Questions are being asked, solutions discussed, and products and information services reviewed to identify what the Library needs and can do to facilitate improved scholarly communication.

Staff Stress and Adaptation

Experience has shown that even though the staff supports the use of technology as solutions to existing problems and improved access to information, those same tools create problems as well for the staff.

During the transitional period, employees need to know dual systems. For example, circulation staff need to understand the manual circulation systems as well as the new GEAC system during the conversion period. As described in the previous section catalogers already have experienced a comparable situation.

Reference librarians are faced with the problem of when to advise or require users to consult paper-printed indexes instead of online counterparts. Coming to the fore is the question of the appropriateness of using collection development funds for "access" to instead of "ownership" of information.

During the transition period, the risk of traditional services and new services being in conflict is almost certain, and staff holding differing views could inject stress within the workplace during a period when unity is most important. Therefore staff willingness to examine what is important and reaffirm its commitment to meet new challenges with vision and vitality will be critical if the Library is to fulfill its mission.

Some other thought-provoking questions should be mentioned. How frequently can rules and values under which the staff function and contribute change without causing disruption? Can staff work in and users accept a library environment which is constantly changing? How much analysis is acceptable at any one time? Are people needs submerging beneath the "needs" of computers and technological systems? Both the positive and negative aspects of change must be acknowledged as the Library moves along its course of action.

Collection Development via Computers

Collection development via computer terminals is developing rapidly. During 1982, the Washington Library Network and selected libraries in the United States began to order materials using computer-tapes supplied by Blackwell North America. Dana Alessi, representative of BNA, described the process during her recent visit to the University Library. Blackwell North American sends a magnetic tape of new titles in MARC format weekly to the participating libraries. Using CRT screens, the staff selects titles wanted for the collection from the 500 new titles offered that week. The order is placed online and the record added to the library's online catalog without any record preparation by the library staff. When the weekly file is published in floppy disc, selectors could use microcomputers in the office or at home. Titles could also be profiled by subject areas and distributed to faculty who contribute to the collection development process. Then all the orders could be collated and returned to Blackwell North America and at the same time the records could be added to the library's online catalog.

The January 17, 1983 issue of LJ/SLJ Hotline described a new use of OCLC archival tapes at the University of Wisconsin-Whitewater. Subject listings by department are produced, giving an "ordering profile" of the unit and providing clues to possible gaps and over-emphasis in acquisitions.

Collection Development and Access Funds

The technological revolution in libraries has questioned a long-standing principle that access to information through libraries is free. It requires money to acquire, catalog, shelve, and circulate materials. The Library has budgeted for all of these activities in the past. These costs are not easily calculated per item or per use of a particular title. However, this is not true for information in electronic formats. Since it is very easy to calculate costs for each transaction or use, the danger is that the historical value of free access will be abandoned and users will be charged.

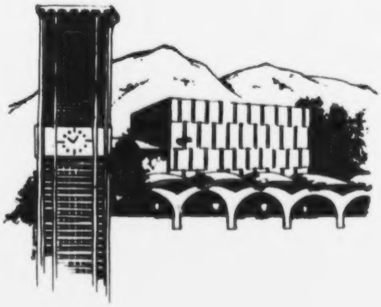
The introduction of technology does not necessarily mean that money will be saved in the short-term. Instead the opposite usually happens and budgets need to be increased. Until online systems are sophisticated enough to be used directly by users without instruction and are more reliable, the library is not in a position to discontinue traditional information sources without causing a serious deterioration of its services. For example, until the library has in place an online catalog, it must continue to print and file cards into the library catalogs. Subscriptions to Psychological Abstracts cannot be cancelled until the users can access it online without cost and independently of staff.

When journals, books, reference works, and other information sources are acquired in electronic formats, it is appropriate to use library funds for their acquisitions and cataloging. An advertisement from John Wiley & Sons, Inc. suggests that videodiscs will be expensive. It is selling "The Puzzle of the Tacoma Narrows Bridge Collapse" for $125.00. Also it should be noted that the disc can only be played on a programmed Disco-Vision 7820 videodisc player and the Pioneer VP-1000.

The cost of using these materials takes on a new dimension since it costs to "read" an electronic source as opposed to a paper-printed source of information. Who should pay for these costs? Does it make any difference whether the use occurs inside or outside the library? Nina Matheson states: "The challenge to the faculty is to understand the need to invest in information technologies even in financially tight times". This presents a challenge to library managers to educate the faculty so together the scholarly community can continue to improve the transfer of knowledge.

SELECTED SECTIONS

The UCR Library Plan for the Eighties



University Library
University of California, Riverside
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1. INTRODUCTION

1.1. The Purpose of the Plan

The purpose of this plan is to describe briefly the Library and each of its functions, to state assumptions and principles which underlie the plans for the future, and to present the objectives the Library has for the Eighties. This plan is intended to serve as an overall planning document, as well as a descriptive introduction to the UCR Library system.

In June of 1980, the Task Force on the University Library and the Academic Mission prepared a report to the Chancellor. This plan will further amplify the Task Force's report, and describe in more detail the planning objectives of the Library for the next decade.

The Library has established a regular mechanism for setting goals and objectives on an annual basis. Each year the management team of the Library participates in a management planning workshop for the purpose of reviewing the year's activities in the context of the previous year's goals and objectives. Overall goals and objectives are set for the Library and each administrative unit, and these are codified in the UCR Library Planning Notebook. The *UCR Library Plan for the Eighties* will be a longer range extension of this planning process and will be used as a foundation for the Planning Notebook.

1.2. Organization of the Plan

The *Plan for the Eighties* is organized into a series of sections, each one devoted to a particular aspect of the Library. The second section is an executive summary of the major planning assumptions and goals and includes a general description of the Library.

1.3. The UCR Library in the University

Academic libraries play a central role in the mission of the university they serve. In the draft *University Planning Statement* (September 30, 1980) the fundamental mission of the University was stated, and it is appropriate to quote from it here for the purposes of putting the Library plans into proper perspective:

> The distinctive mission of the University is to serve society as a center of higher learning by helping students to explore and discover new knowledge and by preparing them for life as productive citizens in a free society, by providing long term societal benefits through discovery and transmission of advanced knowledge. This obligation, more specifically, includes undergraduate education, graduate and professional education, research, and public service, which are shaped and bounded by the central and pervasive mission of discovering, advancing, and sharing knowledge.

The Library participates directly in this mission by providing facilities where knowledge may be explored and discovered, by serving as the means for transmitting advanced knowledge, and perhaps most importantly, by serving as a repository for the records of the intellectual and cultural evolution of our civilization. With its programs in reference and library instruction, its carefully developed collections, and its advanced automated methods for organizing and providing access to these collections, the Library is an integral part of the research and instructional program of the University.

1.4. The UCR Library and Systemwide Planning

In July of 1977, *The University of California Libraries: A Plan for Development* (The *Plan*) was issued by the Office of the Executive Director of Universitywide Library Planning and subsequently adopted as policy for the University's libraries.

This *Plan* formalized the concept that the libraries of the University were in reality a single library, and that the entire University community should have access to all the library resources of the University.

The major objectives of the *Plan*, and the progress toward achieving these objectives may be summarized as follows:

1. To improve bibliographic access to the University's collections. In the spring of 1981, a prototype online union catalog will be tested on each campus providing UCR Library users access to a million items held in the University's collections. In the future, the union list of serials data may be merged into the union catalog data base providing access to both serials and monographs.
2. To install automated circulation systems on each campus. Since 1978 the UCR Library has been operating on an automated circulation system developed by C. L. Systems, Inc. (CLSI).
3. To improve interlibrary loan service. Since 1979, the UCR Library has been using an automated interlibrary loan subsystem developed by OCLC, a non-profit corporation in Columbus, Ohio. Intercampus loan has been expedited through increased cooperation among campuses.
4. To improve information and instructional services. The UCR Library has developed a formal course in library instruction and is providing course integrated instruction. In addition, several librarians are teaching bibliographic courses through academic departments. Information services have been enhanced by the introduction of computer literature searching.
5. To use technology in cataloging and processing. The UCR Library has been using OCLC as its cataloging system since 1977 and is currently planning the use of automation to expedite the acquisition and processing of materials.
6. To create regional compact storage facilities to house low-use materials. The Southern Regional Storage Facility should be completed by early 1984.

While the UCR Library has been and will continue to be supportive of the *Plan,* there have been many problems encountered in trying to fulfill its objectives. In October of 1978, the Library prepared a document entitled *The University of California Libraries: A Plan for Development, and Its Impact on the UCR Libraries,* which enumerated these problems. For purposes of the *Plan for the Eighties,* a few of the major problems should be emphasized.

1. The *Plan* proposed a Model for Current Acquisitions which was approved and subsequently funded by the State. On the basis of this model, the Riverside campus was budgeted for 52,000 volumes annually. However, the funding provided has enabled the Library to acquire fewer than 40,000 volumes/year. Inflation and devaluation of the dollar have seriously eroded the Library's ability to acquire the number of volumes established by the model. In addition, the Library is acquiring materials such as films, video tapes, and other media, which are not provided for in the model.

2. The *Plan* states that the productivity of cataloging would improve and lower operating costs would result from the use of an on-line technical processing system. The introduction of OCLC has not reduced the cataloging costs of this Library. The Library has managed to reduce the overall staffing in Technical Processing by centralizing technical processing functions in a single department and streamlining procedures. Given the rise in salaries and the on-going costs of utilizing OCLC, the cost of cataloging a title has not decreased. Furthermore, if the Library were to receive a book budget adequate to purchase 52,000 volumes/year, the Technical Processing staff would have to be augmented to handle the increased workload.

3. The *Plan* did not take into consideration the full impact of automation on the Library. The preparation and training necessary for automation have far exceeded expectations, and the anticipated savings from automation have not been realized. Service, on the other hand, has been improved and the demands for service have increased because of these improvements.

4. The *Plan* focuses on systemwide issues and does not

> address the needs for local campus automation necessary to improve services and decrease the rise in cost of these services. Library processing continues to be highly labor-intensive and because of the rise in salaries, continues to be very expensive.

The demands to achieve local and systemwide objectives will continue to be a challenge and a strain for the UCR Library.

1.5. Library Cooperation Within the University

The UCR Library is dedicated to cooperation within the University. The Library 1) participates in the University's Shared Acquisition Program; 2) supports priority interlibrary loan service to UC Libraries; 3) maintains intercampus bus service to UCLA six days a week, which provides a link to the other Southern UC campuses through their bus services to UCLA; 4) contributes serial records to the California Academic Libraries List of Serials (to assist patrons in locating materials for interlibrary loan, and potentially, for cooperative collection development); 5) contributes records to the national OCLC database and, thereby, to the UC Union Catalog of University holdings; and 6) operates a project to convert existing records to machine-readable form for local and systemwide use. In summary, the Library actively participates in cooperative programs with Systemwide and other UC Libraries.

The UCR Library has cooperated most actively with the UC Irvine Library. There have been several meetings with UCI Library staff to explore the possibility of cooperative collection development, sharing media and low-use serial titles, providing a direct intercampus bus, and other ways in which programs and services can be cooperatively developed.

1.6. The UCR Library and the Region

Public service is one of the basic missions of the University, and while the basic mission of the UCR Library is to serve the needs of this campus, it also has an obligation to serve as a library resource for the region. Anyone may use the collection in-house and ask for reference assistance. A library card for circulation privileges may be purchased for $10.00 a year. The Library participates in two regional networks: IEALC (Inland Empire Academic Libraries Cooperative) and SIRCULS (San Bernardino, Inyo, Riverside Counties United Library Services). The first allows for reciprocal borrowing privileges for faculty and students among its members; the second, funded by State Library money, is an interlibrary loan and reference service network. The Library is a member of the California Library Authority for Systems and Services (CLASS), an intersegmental organization dedicated to promoting library service within the State.

The Assistant Vice President for Library Plans and Policies for the University is coordinating a study of the extent of community use in order to support a possible budget augmentation from the State. UCR plans to supply data for this study and to support efforts for acquiring adequate funding to meet the increasing demands.

1.7. The UCR Library and the Nation

Libraries can no longer exist in isolation from one another. They are becoming increasingly interdependent for sharing resources and knowledge. The UCR Library must operate within the context of national and international trends and standards. The rapid advancements in computer technology have provided the mechanism for effective cooperation, and in the not-too-distant future we will have the capability to identify, locate, and borrow library material from most major libraries in the country, and perhaps the world.

The UCR Library is a member of the Association of Research Libraries, an association of over one hundred large research libraries dedicated to the enchancement of library services and the sharing of resources. The Library is also a member of the American Library Association. These memberships include numerous publications and conferences and provide a means of keeping abreast of national trends and directions. Librarians are encouraged to participate in national library organizations in order to assist this Library by being fully aware of issues, concerns, and new developments facing academic libraries today.

The Library also serves as a national resource in certain special subjects, such as citrus, avocados, dry land research, geothermal energy, and science fiction. These rich collections are widely used and call national attention to the Library. The Library will continue to support these special collecting areas and to publicize widely its unique and rare holdings.

2. EXECUTIVE SUMMARY

2.1. The UCR Library

The UCR Library includes six separate facilities: the General Library, the Bio-Agricultural Library, the Physical Sciences Library, the Music Library, the Media Study Center, and the Instructional Media Resources Center. The Library's combined collections now include more than 1,000,000 volumes, 14,000 serial subscriptions, 300,000 government publications, 65,000 maps, and a variety of media material including 20,000 sound recordings.

The General Library's collections of around 800,000 volumes supports primarily the fine arts, humanities, and social sciences. It houses six major departments: Library Administration; Circulation Services; Collection Development, including Special Collections; Government Publications; Reference Services, including Interlibrary Loan; and Technical Processing. Reserve book collections, typing facilities, study carrels, a listening room, photoduplication facilities, and microform reading rooms are also provided in the General Library.

The Bio-Agricultural Library is located in Batchelor Hall. Its 115,000 volumes include outstanding collections in the biological sciences, entomology, arid land agriculture, and subtropical horticulture.

The Physical Sciences Library is located on the first floor of the Geology Building. Its 75,000 volumes support chemistry; geography; geology; geophysics; physics; pre-engineering; and computer, environmental, and soil sciences.

The Music Library is located in the Music Wing of the Humanities Building and houses some 13,000 scores and 8,000 sound recordings. Cassette and disc listening facilities are also provided.

The Media Study Center is located on the lower level of the Classroom Wing of the Humanities Building, Room A127. The Center provides listening facilities and computer-aided instruction primarily for the study of language and houses the Library's collection of media, with the exception of disc sound recordings which are in the Music Library and the Library Listening Room.

The Instructional Media Resources Center provides multi-media production facilities and audio-visual services to the campus. It is located in the basement of Sproul Hall.

The Library is supported by a Friends of the UCR Library organization, which has presented a variety of programs related to the Library's collections. It has donated funds in support of the Library, and most recently purchased the Trianon Press facsimilie edition of William Blake's *Songs of Innocence and of Experience* as the Library's millionth volume.

The Library, with its broad range of collections and services, is a complex organization requiring a wide variety of expertise to function effectively. Administrative and personnel management skills, fiscal and inventory control, research and planning, in addition to library expertise in collection development, bibliographic control, and reference and instructional services are all required for the operation of a university library. The Library serves as a business organization in providing efficient use of resources, a service agency in developing and implementing effective programs, and an academic institution in disseminating and providing access to information.

The primary management team for the Library is the University Librarian's Cabinet which is made up of the major department heads of the Library, a representative from the Librarians Association of the University of California, Riverside (LAUC-R), and a representative from the Library Support Staff Association (LSSA). LAUC-R is the Riverside Division of the statewide Librarian's Association of the University of California, a formal advisory body to the President of the University on all matters pertaining to libraries. LSSA is comprised of the non-academic staff working in the Library and at present, serves as an informal advisory group to the University Librarian. The Library also makes use of several standing committees such as the Cataloging Policy Coordinating Committee, the Circulation Task Force, and the Computer Planning Committee, as well as ad hoc committees to deal with specific issues. The staff is encouraged to participate in the planning and implementation of programs and services within an acknowledged framework of available budgetary resources and changing, often conflicting, demands for these resources.

The most valuable resource of the Library is the staff. It is the collective ability, knowledge, and expertise of human resources which gives any organization its character and potential for success. The Library will continue to make every effort to recruit the most qualified and competent staff. The Library will continue to provide opportunities for staff development and growth in order to maintain and to increase the quality of its human resources.

2.2 Assumptions Regarding the Eighties

The Eighties are bound to be one of the most exciting decades in the history of libraries, primarily because the rapid advances in technology will offer libraries many new alternatives for improved services and programs. There are several basic assumptions which will underlie the plans and goals of the UCR Library in the Eighties.

1. The University Library through its collections, staff, and services will continue to support the research and instructional needs of UCR's faculty, students, staff, and administration, and will continue to serve as a major resource for the Inland Empire which includes Riverside, San Bernardino, and Inyo counties, as well as parts of eastern Los Angeles, Kern, Mono, and Imperial counties.

2. Technological developments will continue at a rapid pace during the 1980's and the Library supports the development and implementation of automation to provide more efficient processing, greater control over the collections, and more effective and comprehensive access to information.

3. Funding for libraries at the level necessary to maintain current programs and services and to accomplish the full use of automation will be the major challenge of the decade. It is anticipated that the rate of increase in operating costs will decrease

as major functions within the Library are automated.

4. It is unlikely in the foreseeable future that new library facilities will be constructed for the UCR campus. The Library will run out of space to house volumes by the end of the decade when the collection reaches 1.25 million volumes. At that time one volume will be sent to the Southern Regional Storage Facility for each new volume acquired.

5. The Library's collections will continue to be affected by deterioration, theft, and mutilation.

6. The student population will probably continue to change during the 1980's. The level of preparation of entering students may continue to decline; an increase in re-entry and part-time students is expected; and the average age of students may rise. These changes will make new demands on reference services and library instruction.

7. The publishing industry will also be affected by technological change during the 1980's. Computer data bases, videodiscs, broadcast video, cable television, videotext systems, and microfiche have joined books as vehicles for the dissemination of information. University libraries of the 1980's will be purchasing, cataloging, and providing computer access to a whole variety of new electronic media. These formats will also require special equipment in order for patrons to read them, and the acquisition of this equipment will be yet another fiscal problem for the Eighties.

8. The Library will continue to support in principle the *University of California Libraries: A Plan for Development* prepared by the Office of the Assistant Vice President for Library Plans and Policies.

9. The Library will continue to support the concept of active cooperation among UC Libraries, including cooperative and shared acquisitions, interlibrary loans, a union catalog of University holdings, and frequent communication among the staffs and systemwide administration.

10. The University Library will continue to participate

actively in the development and implementation of national library planning and standards through cooperation with the Library of Congress, membership in CLASS (California Library Authority for Systems and Services), the OCLC Network, the Association of Research Libraries, and the American Library Association.

2.3. Goals for the Eighties

1. The Library will continue to develop and to implement programs and services consonant with the basic mission of the University.
2. Within the constraints of the book budget, the Library will acquire and make available a very high percentage of the materials required for the support of approved programs of instruction and research and will of necessity have to rely on the combined resources of the UC system and national resource sharing networks to supply what cannot be acquired.
3. The Library will continue to study the use of its collections and services and to refine collection development services and management policies in light of these studies.
4. As information is made available in new formats, such as videodisc or computerized data bases, the Library will strive to acquire these and to provide the necessary equipment to utilize them.
5. The Library will explore ways to control the temperature, humidity, and quality of air in the Library in order to slow the rate of deterioration of its holdings. The Library supports efforts within the University, State, and nation to develop solutions to this perplexing problem.
6. The Library will actively pursue the purchase and installation of an electronic security system to protect the collection from theft.
7. The Library will make increasing use of automation throughout the 1980's in the following ways:

a) The card catalog will be replaced by an on-line catalog.
b) Computer assisted reference services will continue to be provided, and the Library will make every effort to keep abreast of and to make available new data bases and information services.
c) Interlibrary loan will be facilitated by bibliographic networks such as OCLC, by the UC On-Line Union Catalog, and by telefacsimile and other technological developments.
d) Acquisitions, book fund accounting, and serials processing will be automated during the 1980's.
e) Enhancements to the circulation system, such as adding the capability to handle Reserve Book Room transactions and providing more management information for collection development will be pursued.
f) A management information system will be developed to maintain a statistical data base on the activities of the Library and to produce accurate, timely reports for management purposes.

8. The Library will conform to national standards, such as those provided by the second edition of the *Anglo-American Cataloging Rules*, the Library of Congress, and the national bibliographic utilities, in the cataloging of library materials.

9. Reference and instructional programs will be given a high priority in order to assist students, faculty, researchers, and the community to make the most effective use of library resources.

10. The Library will strive to remain abreast of the most current developments and techniques in management and administration to enhance the effectiveness of operations, personnel development, and related programs.

11. The Library will actively seek additional funding from the University's campus and systemwide administrations, from state and federal agencies, and from private sources, in order to accomplish these goals.

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MIT LIBRARIES - FIVE YEAR PLAN

I. Executive Summary

The detailed five year plan that follows has provided the administration and staff of the MIT Libraries with an opportunity to assess the quality and level of current activities and to develop a scenario for the future that reflects the Libraries' needs in the context of the Institute's current and planned programs. We believe the plan is imaginative and realistic. It builds upon the traditional strengths of collections and services that have been designed to serve the very special needs of this institution. It is realistic in that the plan seeks to maximize the present and potential benefits of library and information technology while recognizing the limitations that will necessarily be involved in increasing the level of support during the next five years. The importance of a strong and dynamic library system to MIT is intrinsic to the plan as enunciated in the statement on "Mission and Continuing Objectives." The plans and programs outlined represent those activities that are deemed to be of high priority and result from an exhaustive analysis of all aspects of the Libraries' operations in the context of current and anticipated developments, both internal and external.

The total proposed increase in general operating funds over the five year period of $1.1 million represents 15.8% of the FY1984 budget, or an average increase of 3.2% per year. This is comprised as follows: Salaries and Benefits: 12.5% (2.5% per year); Collections: 21.4% (4.5% per year); Other Operating Expenses: 34.2% (6.8% per year). An additional $1.4 million is proposed for non-recurring expenses, mainly connected with the implementation of an integrated library system; it is anticipated that a major portion of these funds will be solicited through a development program.

The highest priority in the Libraries' five year plan is the group of programs aimed at creating an integrated library system. Such a system, building on the foundation of the automated circulation system to be implemented during the current academic year, will enable the MIT Libraries to expand and enrich its services with optimal use of resources. An integrated library system will consist ultimately of a computerized circulation system, automated acquisitions and serials control systems, automated accounting and commitment functions, and, an online catalogue. The implementation of an integrated system will reduce the rate of growth of the budget by replacing manual systems with computerized ones. It will also enable MIT to cooperate with other research libraries on a national and regional level. An online catalogue will ultimately reduce the cost of bibliographic control while providing library users with a more sophisticated means of access to information and collections. The key element in the establishment of an integrated system is the conversion of bibliographic records for items received between 1964 and 1973. Obtaining funding for this project will be the major focus of the proposed development program outlined in the plan.

Second in importance to the integrated library system are programs designed to strengthen the library collections, improve the physical environment for both people and collections, and extend information services. Resources applied to collection development will enrich the quality of holdings in areas where MIT has traditionally been strong as well as in new areas of teaching and research. Maintaining the physical integrity of existing collections requires both improvement of environmental conditions and a major effort in preservation. Although there is a clear emphasis on the use of the most recently acquired library materials, the uniqueness of much of what is held at MIT and its long-term value for scholars and researchers both within and outside the Institute require that efforts be made to inhibit the rate at which the printed and manuscript collections are deteriorating. At a minimum, all libraries should have air conditioning and humidity controls to provide a constant and non-destructive environment. In the area of information services, the five year plan provides for expanded access to information in all forms and emphasizes the desirability of access to external sources of information, both bibliographic and full text as a substitute for local acquisition, processing and storage. The plan also calls for the Libraries' becoming an integral part of the campus information network emanating from Project Athena.

Three special program areas, the Institute Archives and Records Management, the MIT Museum, and the Microreproduction Laboratory, have been treated separately in the plan. Each of these programs plays a major role in the overall operation of the Libraries but they also have a unique character. The Archives and the Museum have, as one of their major goals, the documentation and preservation of the history of the Institute. The Records Management Program, administered by the Institute Archivist, also serves the important function of conserving academic and administrative department resources through the transfer of less used records to lower cost space. Modest staff increases proposed for both Archives and Records Management and the Museum are clearly justified if these programs are to serve the goals outlined for them in the plan. No funding increases have been proposed for the Microreproduction Laboratory since its operations have been and will continue to be based on income received for services provided to the Institute community and to the scholarly world in general.

The space needs identified in the plan call for a relatively low level of expansion on the central campus and of which additional space for Rotch Library represents the vast majority. Equally vital is the need for additional space for technical services operations in Hayden Library. Additional space for the Records Center beginning in 1986 required in the plan might well be found on the periphery of the campus or entirely off campus.

The Libraries' five year plan will ultimately have to be amended to reflect the programs and plans of academic departments, laboratories, and research centers. In its present form, however, it does provide for modest growth and the adaptation of the library system to the changing library and information technology environment. If fully implemented, the plan will enable the Libraries to continue to serve the research and teaching needs of the Institute in a dynamic, imaginative, and cost effective manner.

January 5, 1984

Jay K. Lucker
Director of Libraries

STATE OF THE MIT LIBRARIES

Continuing Objectives and Current Programs

Assuming that the "Mission and Continuing Objectives" statement reflects the long range goals of the MIT Libraries, we have attempted to assess the extent to which the Libraries are able to accomplish them given the availability of resources, the existing technology, and national and regional programs. For each objective we have reviewed current activities to determine how well we are meeting these objectives. This process has also enabled us to set priorities in the five year plan.

Described below are the major elements of each objective with an indication of its current status. The degree to which we have attained these objectives is assessed at one of three levels:

A. What we are doing well.

B. What we are not doing as well as we should.

C. What we are not doing at all.

In many cases, our ability to move from level B or C to level A is predicated upon the securing of additional resources as reflected in the five year plan. In a smaller number of cases, our ability to improve the level of attainment is dependent on external organizations and developments over which we have little or no control.

Acquire and process, in an effective manner, the information resources identified as necessary for the MIT Libraries' Collections.

A. Introduction of New Title Announcement Service that will expedite the acquisition of new books.
Effective communication maintained within the Libraries and with vendors, donors, and exchange partners.
Provide access to users to materials in process by filing orders in public catalogues and by circulating new books as soon as received.
Participate in Boston Library Consortium serials review project.
Participate in National Collections Inventory Project.

B. Evaluation of vendors supplying books and serials to the MIT Libraries is irregular and occasional.
Acquisition of MIT publications (excluding theses) is incomplete because of inadequate staff and, in some cases, limited availability.
Information on materials in process available only for individual libraries; the only comprehensive file is the Institute Library Catalogue in Hayden Library.
Limited ability to process large gifts.

C. We do not acquire between 20% and 30% of publications issued by MIT departments, laboratories and centers.
Materials on order are accessible only by title. Multiple access points for materials not fully processed awaits implementation of an online catalogue.

Provide effective bibliographic control for all information resources acquired for the MIT Libraries' collections.

A. For materials catalogued, we follow national standards including necessary authority control system; we utilize Library of Congress or other cataloguing records insofar as possible.
   Most special printed collections are catalogued at the local level. Rare books and manuscripts on "Technology and Society" are currently being catalogued into national data bases.
   Participate in national bibliographic network through OCLC resulting in the creation of a machine readable record of MIT's cataloguing.
   Catalogue all MIT theses and many other MIT publications for national bibliographic data base.
   Maintain good communication among staff and between staff and users relative to adequacy of bibliographic records.
   Publish and distribute list of current serial subscription (Serials in the MIT Libraries).

B. Cataloguing of some incoming material could be expedited if we had additional staff and/or had staff that could be shifted to other subject areas when needed.
   Minimal local processing of archival and manuscript collections. Finding aids and full processing possible only for those manuscript collections whose organization is supported by grant funds.
   Minimal local organization of museum collections (registration).
   Retrospective conversion of bibliographic records for materials received between 1964 and 1973 is proceeding very slowly. The conversion of these records is essential for the creation of an online catalogue.

C. There is no systematic access across the system to materials catalogued by other than the central cataloguing unit; e.g., maps, technical reports, audio-visual materials, slides.
   Two large special collections not catalogued: Baldwin (civil engineering); Hart (nautical).
   Manuscript, archival, and museum materials not represented in general library catalogue or in national bibliographic data bases.
   Very limited subject access to MIT publications.

Develop and manage a system of interdependent physical collections which intellectually form a single collection appropriate to the research and education programs of the Institute.

A. Basic collection development program is effective. New Title Announcement Service will provide more time for subject specialists to spend on selection.
Acquire those archival and manuscript collections offered to us and whose acquisition is consistent with collection policy.
Acquire materials for the Museum as they are identified in the course of other activities or offered to us.
Reasonably good communication with user community to determine information needs and changes in research and education programs.
Sound structure for maintaining set of dynamic collection policies.
Replacement of missing materials as identified. Brittle book policy being developed.
Modest program of records scheduling, primarily reacting to requests from academic and administrative offices.
Well developed policies and procedures for binding and repair. Well trained and knowledgeable staff who use state-of-the-art techniques.
Participation in resource sharing programs through OCLC, the National Collections Inventory Project, and the Boston Library Consortium Union List Project.
Cooperative and consortial relations with a large number of libraries in the Boston area provides access to subject collections not emphasized at MIT (e.g., medicine, law, theology, education).

B. Lack of staff and acquisition funds preclude timely response to new programs. Collection support for new teaching and research programs not adequate.
Development of specific collection policies for each subject area not adequate.
Application of records management program throughout the Institute is incomplete.
Binding budget and staff not sufficient to maintain entire collection. Serials not bound in a timely manner. Repair done on a "crisis" basis rather than on the basis of need.
Need to develop additional resource sharing programs in new areas of research and teaching, e.g. pharmacology.

C. Very little acquisition of material in non-standard formats: videotapes, optical disks, machine-readable information.
No ongoing program of collection evaluation and assessment.
No systematic program for selection of material for transfer to remote storage and for weeding of the collections.
No aggressive collecting of archives and manuscripts.
No advanced records management programs: machine-readable records, automated processing, vital records, forms control, micrographics.
No comprehensive preservation program because of inadequate resources for staff and operations.
No systematic preservation of rare books and manuscripts.
No cooperative collection development or cooperative cataloguing on a national level.

Provide effective information services for the MIT community, and, as appropriate, for others designated as eligible under various arrangements.

A. Basic reference services are effective when service points are staffed.
   Good to excellent reference collections containing a variety of tools with emphasis on research-level materials.
   Online quick reference service in all divisional and most branch libraries, primarily from 9 a.m. to 5 p.m., Monday through Friday.
   Extended data base searching through Computerized Literature Search Service including automatic updating through SDI service.
   On demand instruction in use of libraries and in specific subject areas. Librarians available on site or in scheduled classes. Undergraduate seminar in library research methods.
   Effective exhibition program in divisional and branch libraries, in Institute Archives, Compton and Hart Galleries.

B. Reference service by professionally trained staff available in only one library after 5 p.m. and on weekends.
   Insufficient staff restricts extent of service that can be provided during the day.

C. We are not open all the hours that many users would like us to be.
   We do not presently provide reference and information services via electronic mail.
   We are not able to provide extended reference service, literature searching, compilation of bibliographies, etc., that would be possible through a "fee for service" operation. This would enable us to provide service to non-MIT users and improve the range of services available to the MIT community.
   We should be doing more to publicize collections and services through exhibits of special collections, a faculty newsletter, more articles in local media.

Provide effective physical access to materials whether or not owned by the MIT Libraries.

A. A majority of the collections are on open shelves and accessible approximately 100 hours per week.
Security system in five large libraries and Student Center Library.
Able to deliver materials within 24 hours between libraries.
Good interlibrary borrowing services through OCLC and Boston Library Consortium.
Installation of automated circulation system during FY 1985 will provide better service to patrons and better management information for Libraries.
Copying services available in all libraries with more extensive and sophisticated level of service in Microreproduction Laboratory.

B. Severe crowding in Rotch Library has necessitated splitting of collections with a large portion of active collections now in Resource Sharing Center.
Insufficient reading space in Dewey Library.
Physical maintenance of stacks and reading of shelves not adequately done because of staff limitations.
Existing staff not adequate to deal with anticipated large increase in circulation resulting from display of records through automated circulation system.
Hours of access not sufficient in the view of many of our users, especially scientists.

C. No security systems in branch libraries: Music, Lindgren, Aeronautics and Astronautics.
No system for limiting access by unauthorized users.
We are not reimbursed for use of libraries by non-MIT users who have not made specific arrangements or who are not members of cooperating institutions.

Organize and manage the activities of the MIT Libraries in such a way as to ensure the achievement of goals and promote effective levels of coordination, communication and control.

A. Good internal management structure.
Involve Faculty Committee on the Library System in policy and planning discussions.
Communication with Institute administration through Academic Council and through direct reporting to the Provost.
Close cooperation with regional and national organizations: Boston Library Consortium, Association of Research Libraries, Council on Library Resources.
Budget and accounting systems have been improved providing better management information and better accountability. Budget and accounting functions will be automated by the end of FY 1984.
Effective personnel management program including personnel policies and record keeping. Excellent relationship with central personnel function.
Effective orientation program for new staff. Staff Development Committee and other committees carry out staff development and training programs.

B. Ability to evaluate the Libraries' collections and services on a continuing basis limited by staff availability.
Ability to anticipate changes in research and teaching programs highly dependent upon communication with faculty and administration. Libraries need to be brought into discussions earlier in the process.
We need to explore additional avenues of cooperation with Harvard.
Need to seek means of improving performance evaluation system and recruitment of professional staff (length of time required).
Furniture repair and equipment maintenance and replacement should be done more systematically but is limited by availability of funds.

C. We need to identify those who do not use the Libraries' services and why.
We need to develop external support for programs through friends' groups and/or a fee for service program.
A supervisory training program is needed preferably in cooperation with the Personnel Office.
Programs are needed for retraining of staff in the light of anticipated changes resulting from the application of technology.
Insufficient space for current needs, both collections and staff, in Technical Services, Resource Sharing Center (within five years), Museum, Rotch Library, Institute Archives, Records Center, Dewey Library.
Environmental controls are lacking in most library units.

Participate effectively at appropriate levels in the administration of the Institute.

A. Participation on Academic Council and Administrative Council.
Direct contact by administrators and department heads with academic and administrative personnel of the Institute.

B. We have been unable to obtain the necessary level of support for the MIT Libraries.
Need to improve the integration of library programs with other areas at the Institute such as Bursar, Controller, Accounting Office, Administrative Data Processing, Registrar.

C. We should promote the use of Computer Output Microform (COM) and Computer Assisted Retrieval (CAR) throughout the Institute. (A plan for doing this is being developed).

Participate effectively in the development of national and international information policies and in appropriate activities and research efforts in the areas of information management, information creation and dissemination, and research librarianship, both within MIT and at local, national, and international levels.

A. Participation in Association of Research Libraries, American Library Association, American Society for Information Science, and Special Libraries Association programs and activities. Staff also participate in a wide range of specialized library and information science organizations.
Participation in activities of networks and consortia: OCLC, Nelinet, Boston Library Consortium, Faxon union list project.
Research grants have been received from a number of sponsors including U.S. Office of Education, National Science Foundation, Andrew W. Mellon Foundation, National Historical and Preservation Records Commission.
MIT Libraries are working closely with several MIT research groups particularly in the Laboratory for Information and Decision Systems and the Architectural Machine Group.
Travel policy and travel budget permit extensive participation by staff in professional activities.
Institute tuition policy provides staff with access to a wide range of educational opportunities.

B. We need to develop detailed plans for integrating the Libraries' programs and activities with Project Athena.

MIT LIBRARIES - FIVE YEAR PLAN

Summary

	Total FY84	Incr. Year 1	Total FY85	Incr. Year 2	Total FY86	Incr. Year 3	Total FY87	Incr. Year 4	Total FY88	Incr. Year 5	Total FY89
STAFF (FTE)											
Librarians	69.3	3.0	72.3	4.0	76.3		76.3	2.5	78.8	2.0	80.8
Support	112.0	.7	112.7	7.0	119.7	8.5	128.2	2.0	130.2	2.0	132.2
Students	35.6	1.5	37.1	(.3)	36.8		36.8		36.8	1.5	38.3
TOTAL	216.9	5.2	222.1	10.7	232.8	8.5	241.3	4.5	245.8	5.5	251.3
EXPENDITURES ($000)											
Salaries/EB	4998.0	72.0	5070.0	215.0	5285.0	140.4	5425.4	94.3	5519.7	102.1	5621.8
Collections	1793.8	40.0	1833.8	94.0	1927.8	83.0	2010.8	87.0	2097.8	80.0	2177.8
Operating Exp.	381.3	15.5	396.8	23.5	420.3	20.5	440.8	66.0	506.8	5.0	511.8
TOTAL	7173.1	127.5	7300.6	332.5	7633.1	243.9	7877.0	247.3	8124.3	187.1	8311.4
Non-recurring Funds			35.0		250.0		294.8		450.0		400.0
Capital Equipment			78.0		114.0		178.0		229.0		45.0

MIT LIBRARIES - FIVE YEAR PLAN

Major Elements of the Five Year Plan

I. The Institutional Environment
   A. Assume no significant increase in the size of the student body or faculty. Assume no significant change in the proportion of undergraduate and graduate students.
   B. Any new major research and/or teaching programs that require significant library resources will require funding beyond that which is projected in the Plan.
   C. The Libraries' Plan should be revised to reflect the plans of academic departments and research centers once these have been assembled.
   D. It is highly desirable to link the Libraries electronically with the rest of the Institute through Project Athena and other campus information networks.

II. External Factors
   A. Although there will be some changes in the method of publishing and disseminating scholarly information over the next five years, the MIT Libraries will continue to be the principal source of published information for the faculty, research staff, and student body.
   B. The advent of electronic publishing including full text electronic access and the use of optical/video disks may change the method by which the Libraries provide access to information but there will be little impact upon the total cost of library services within the next five years.
   C. Cooperative efforts among the major research libraries in collection development, cataloguing, resource sharing, and preservation will probably not provide significant cost savings within the next five years.
   D. Local cooperative efforts in such areas as serial subscriptions (with the Boston Library Consortium), document delivery (with the Boston Library Consortium and other local libraries), and cooperative storage (with Harvard University) are expected to increase in number and beneficial effect, and are included in the Plan.

III. Program Areas
   A. Collection Development
      - Increase the level of acquisition of books and journals in subject areas that have been historically underfunded and that are important MIT programs, with an emphasis on the life sciences.
      - Increase the level of activity of selection, de-selection, collection management and weeding.
      - Increase the level of acquisition of non-print materials: microforms, videotapes, optical disks, films, machine-readable data.
      - Provide the equipment necessary to access non-print information.
      - Participate in the development of a national conspectus of research library collections in order to promote cooperative collection development, cataloguing, preservation and resource sharing.
   B. Bibliographic Control
      - Maintain the quality of the machine-readable bibliographic data base. (The existing manual data base must also be maintained until implementation of the online catalogue, c.1990.)

MIT LIBRARIES - FIVE YEAR PLAN

- Accommodate an increase in the level of acquisitions. This is mitigated in part by the introduction of new computerized acquisitions and serials control systems.
- Major goal is the development of an online catalogue containing records of all material acquired since 1964. Although not budgeted within the five year plan, this development is contingent upon the completion of two major programs: implementation of the automated circulation system, and retrospective conversion of bibliographic records for material acquired between 1964 and 1973.
- Improve the bibliographic control of MIT publications.
- Provide bibliographic control of non-standard formats.

C. Information Services
- Provide access, through the services of the staff, to information in all forms, whether located within the MIT Libraries or elsewhere.
- Provide, through Project Athena, electronic reference and information services.
- Increase access to external sources of information: full text data bases (in lieu of additional acquisition of printed collections), bibliographic data bases, numerical data bases.
- Establish a "fee for service" facility to (1) reduce the burden on staff of serving non-MIT users; (2) produce income to cover the cost of services; (3) create new staff positions to provide additional services to MIT users.

D. Physical Access
- Improve the efficiency of access to materials by increasing the number of computer terminals accessing the circulation system.
- Join the Center for Research Libraries as a substitute for the acquisition, processing, and storage of less-used material.
- Improve security by installing security systems in branch libraries.
- Provide faster access to collections in the Resource Sharing Center and other locations through the acquisition of a second delivery van.

E. Preservation
- Provide management of the Libraries' preservation program and intensify efforts to maintain the physical condition of the collection.
- Increase the level and quality of collection preservation.
- Preserve unique collections such as engineering journals, rare books and manuscripts through external funding.

F. Other Programs
- Provide essential level of reference service in the MIT Museum.
- Increase outside sources of support for Museum by (1) seeking funding for special projects and general operation; (2) increase the level of activity in the Museum Shop; (3) explore the possibility of establishing a "Friends of the Museum."
- Provide for an accelerated level of acquisition of official MIT records and of papers of the faculty.
- Increase the savings accruing to the Institute in space and storage costs through an accelerated Records Management Program.
- Promote, through the Microreproduction Laboratory, the use of COM (Computer Output Microform) and CAR (Computer Assisted Retrieval) Systems at the Institute to generate savings in personnel and storage costs.

G. Administration
- Increase the quality of the physical environment for users by improving the schedule for furniture and equipment maintenance and repair.

MIT LIBRARIES - FIVE YEAR PLAN

- Provide for central management of all Libraries' space, equipment, furnishings, and physical maintenance.
- Improve management and internal operations through the addition of microcomputers. Link microcomputers to provide electronic mail system within the Libraries.

UNIVERSITY OF PITTSBURGH

Selected Sections

UNIVERSITY LIBRARIES:
A FIVE YEAR PLAN

JUNE, 1984

OFFICE OF THE ASSOCIATE PROVOST
AND DIRECTOR OF UNIVERSITY LIBRARIES

826 CATHEDRAL OF LEARNING
UNIVERSITY OF PITTSBURGH

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APPENDICES. 35

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SUMMARY

To provide a context for library and instructional resources within the University of Pittsburgh, it is recommended that the following be adopted as an institutional priority:

> TO DEVELOP AND MAINTAIN QUALITY IN THE INFORMATIONAL RESOURCES AND SERVICES AVAILABLE AT THE UNIVERSITY AND IN THE WESTERN PENNSYLVANIA REGION.

Plans and priorities for libraries and instructional resources rest on the assumption that they are central and crucial to the mission and goals of the institution as a whole and that their mission is to provide access to the informational resources necessary to fulfill the academic, research, artistic, scholarly and community leadership objectives of the University.

The "programs" which serve this mission are a complex and interdependent set of operations which ensure that resources are collected (selected and ordered), organized (cataloged and labelled), stored (shelved and preserved) and made accessible. One part of the operation cannot be subjected to dramatic changes without other parts being affected. For that reason, there is no summary of priorities for increases or decreases in the libraries' programs. Within each goal, there is a set of objectives which will enable the University of Pittsburgh's libraries to maintain a viable support service for the foreseeable future. The suggestions for increased support will enable fulfillment of the objectives. In some cases, the increased support is necessary simply to maintain the current (1984) level of program activity.

Because of the interdependence of library operations and activities, there are no clearly defined reductions given since almost any program reduction will have a ripple effect throughout the system. For example, while a reduction in the acquisition budget might also result in a dollar saving in salaries in the order and cataloging areas, it could easily save additional support being needed in the reference, interlibrary loan and delivery areas. Thus, while suggestions are given throughout the plan for potential reductions, they are given without thought to their full implications. Many of the suggestions given would need full and careful operational analysis within the libraries before the wider university community discussed their viability in academic and political terms. Some of the reductions listed are clearly unacceptable.

On the whole, the University's support of library and instructional resource services has declined in the past decade. Unless the decline is arrested and reversed, this academic support service will probably, by 1990, be unable to support study and research beyond the undergraduate level. While internal reallocation of funds will occur over time (and with the automation of processes), the overall problem of past underfunding of Pitt's libraries cannot be redressed in this way. Therefore, the plan unabashedly presents arguments for increased support in order to accomplish the stated goals and objectives.

Finally, the plan is presented with the full knowledge that it is a tentative one - pending the outcome of the academic planning process. When firm academic priorities have been delineated, the programs and activities for supporting services must be reviewed and, if necessary, realigned to fit into a new configuration of institutional priorities.

UNIVERSITY LIBRARY SYSTEM

MISSION, GOALS AND OBJECTIVES

I. INTRODUCTION

According to the "UNIVERSITY LONG-RANGE PLANNING POLICIES (1985)", by its very nature, the University defies simple description" (p. 22). So does any library operation.

The "overriding aim of the University" the document continues "is to enhance further the quality of its programs of teaching, research, and public service and to maintain the stature and prestige of the University, its schools, faculties, and graduates" (p. 21). Since libraries are the heart of any university, this can only mean that enhancement of the quality of libraries is central and crucial to the University's ability to achieve its aims. A university cannot be called great or excellent in any area unless its libraries have achieved the same stature in the eyes of faculty, scholars and researchers.

> Thus, the mission of the University of Pittsburgh's libraries is to provide access to the informational resources necessary to fulfill the academic, research, artistic, scholarly and community leadership objectives of the university.

Excellence in research, scholarship, artistic endeavors, educational programs, and in local, regional and state leadership cannot be achieved in a University without excellent libraries. For that reason, the following should be added to the priorities given on pages 2 through 6 of "University Long-Range Planning Policies" as a priority for the University in the years ahead:

> TO DEVELOP AND MAINTAIN QUALITY IN THE INFORMATIONAL AND INSTRUCTIONAL RESOURCES AND SERVICES AVAILABLE AT THE UNIVERSITY AND IN THE WESTERN PENNSYLVANIA REGION.

In this context, the role of the University Library System is to collect, organize, store, provide access to, retrieve and disseminate the information needed - in a timely and cost-effective way - so that the University can achieve its mission, goals and objectives. In an academic library this must be done in a physical environment which fosters the advancement of learning and research.

Plainly stated, the University cannot maintain excellence or eminence without giving its scholars and researchers their basic tools -- library and instructional resources.

* * *

In February 1981, a Provost's Task Force on University Libraries was set up out of growing concern in the entire university community that the quality of the libraries collections, services and staff were eroding at a rapid rate. In the report of the Task Force issued in September, 1981 (and in the subsequent PRMS Proposal), some significant recommendations were made which have mapped a path for centralized administration of all libraries at Pitt for the foreseeable future. The primary recommendation — that there be an increase in the acquisitions budget of 50% over the next five years (adjusted for inflation, CPI index) — was crucial to the qualitative welfare of libraries. In 1984/85, unfortunately, this recommendation seems to have been ignored since the amount given to the acquisitions budget was $97,448; 4.7 percent LESS than the 10.7% needed to cover inflation.

Other recommendations made and accepted included reorganization of the Hillman Library system and the Business, SLIS, and GSPIA libraries into one administrative unit — with the inclusion of Law, the health science libraries, and the regional campus libraries "being postponed until this initial reorganization has been accomplished". The priorities for the new library system were, in some respects, set forth three years ago and remain as an agenda for the future. Superimposed upon this future action plan is the rapid introduction of technological changes — wiring the campus, changes in academic computing support, administrative systems changes — now known as the Campus of the Future project.

There are external pressures as well: changing telecommunications patterns and their escalating cost, the need to preserve our crumbling printed heritage, the electronic information explosion, sky-rocketing costs of access to information, the preparation of library (and university) employees for use of the new technology, the need to participate in national collection preservation and development projects and shoring up of the libraries' deteriorating physical surroundings. The objectives and priorities for the University Library System must ensure, then, that traditional library collection and service objectives are introduced to meet the new and additional demands being placed upon libraries.

The following pages outline the goals and priorities of the University Library System for the next five years. They are interrelated and must be kept in proper balance both strategically and operationally. Money spent on acquisitions would be wasted without a commensurate level of service being maintained. The priorities and programs in the following pages will enable the University Library System to meet the information needs of the students, faculty and staff of the University. They are presented under broad "program" headings pertaining to access to information: collection; organization; storage; and retrieval and dissemination. The underlying assumption for all of these programs is that computer and telecommunications technology will be fully exploited to optimize fulfillment of the objectives and that an expert and qualified complement of personnel will be maintained in order to carry out objectives.

Because the functions of any library are interdependent and intertwined, it is almost impossible to reduce a part without diminishing the whole. Since library collections and services were demonstrated only three years ago to be inadequate and in decline, a reduction of 25% is unthinkable. However, for purposes of fulfilling requirements of the planning exercise, each section includes some potential program reductions.

II.5. GENERAL LIBRARY ENVIRONMENT

GOAL: TO MAINTAIN A FLEXIBLE ADMINISTRATION TO COORDINATE LIBRARY AND INSTRUCTIONAL RESOURCES AT THE UNIVERSITY OF PITTSBURGH.

In order to fulfill the goals and objectives outlined in the previous four sections, the libraries at the University must have an administrative structure which supports and coordinates the component parts so that they function as a whole and are perceived by library users to be a service befitting the quality of the institution as a whole. In an environment such as a university, even when some libraries are not centrally administered, the tasks which are done to achieve one objective in one location are seldom without impact on other people or other processes in other locations. For this reason, in any group of libraries which serve one institution, there is a synergy of objectives, actions and tasks which make delineation of high and low priorities extremely difficult. No one part of the whole can be altered without alterations being required elsewhere in the organization. Similarly, no additional or new programs can be undertaken without the impact on all library operations being considered — regardless of whether or not these libraries report to a Dean or Associate Provost.

At present, the library "administration" at the senior level is very lean compared with other comparably sized library systems. In view of future problems and issues, more assistance will be needed to coordinate libraries on a university-wide basis, especially in areas such as space planning, staff training and development and the application of new technology in public service operations. In the next five to six years, it will be incumbent on the libraries' managers to strive toward some objectives which pertain to monies and their expenditures.

OBJECTIVE 1: Seek economies in library operations which can release funds to introduce new or improved methods of serving users.

While there has been insufficient funding for libraries at Pitt in the past, the cry for more does not obviate the need to continuously examine the internal use of funds to ensure that they are spent in the most effective and useful way. In the future, there must be increasing and objective self-questioning about tasks and procedures along the following lines: Why is this done? Can it be done another, more cost-effective way if it needs to be done at all? Can we eliminate this and still serve our users well? What can we live without so that higher priorities can be funded? Over time, and with constant internal scrutiny — especially when vacancies occur — there should be enough opportunity to enable internal reallocation of at least ten percent of the personnel costs in the University Library System. It would not be unrealistic, for example, to aim to reduce the number of faculty librarians IF (and only if) the remaining librarians and support staff were paid more appropriately and more operations were automated. To achieve improved coordination of libraries at Pitt, administrative reporting lines will have to be altered so that there are less than eighteen units reporting directly to the Associate Provost and Director of University Libraries.

INCREASED SUPPORT:	- Word processing/office automation	$ 40,000
	- Coordination of libraries	40,000

REDUCE:	- Number of librarians by 10%	300,000

OBJECTIVE 2: Attract external funds for the libraries through proposals to granting agencies, foundations and other sources of funds.

The need to focus more effort on this is obvious. To attract funds that can supplement the University's allocations to the libraries will become increasingly important if existing services and collections are to be maintained while new ones are being introduced. Natural magnets for such funds are usually found in the special collections and rare/unique materials which must -- for reasons of national scholarship and heritage — be preserved and processed so they become available to scholars and researchers across the country. Since the decaying walls of Pitt's libraries also need repair, the possibility of reviving a capital campaign to solve the libraries' space problems ought also to be considered seriously in the future. Other candidates are portions of the automation needs, and special projects such as further development of TRAINER in the context of the University's future network.

There is now proof that Pitt's libraries can get outside grants if they try. In FY 84, ten proposals were submitted to various agencies, either by ULS alone or in cooperation with SLIS and UCIS. Of those, four were successful in bringing over $160,000 to the University to support library and library-related projects: indexing Fred Rogers' tape collection, a personnel and book exchange with Shanghai Jiao Tong University, investigating the need for a rapid document delivery system, and transferring deteriorating film negatives to safety film.

* * *

The preceding pages have been peppered with indications that cooperation with other libraries, automation of library operations, and the quality of library personnel are overriding priorities — especially if library and instructional resources and services are going to be supplied in a fashion befitting an institution that strives to distinquish itself as great or having eminence in designated fields. Therefore, the following three goals are both basic and overriding for the achievement of all these goals and objectives:

GOAL: TO MAINTAIN A COMPLEMENT OF PERSONNEL THAT IS QUALIFIED AND ABLE TO CARRY OUT THE OBJECTIVES OF THE UNIVERSITY'S LIBRARIES.

In order for libraries to maintain a complement of the personnel needed to take leadership in the future, and for them to take full advantage of the capabilities of new and emerging technological developments, a number of steps must be taken in the next five years.

OBJECTIVE 3: An affirmative action plan must be developed for the libraries which will improve minority representation at all levels in all libraries.

AND

OBJECTIVE 4: Salaries must be reviewed to ensure that there are no anomalies or inequities caused by discriminatory practices and that salaries paid to library and information specialists in the University match those in the open market.

In late 1983 and the early part of 1984, work was begun by the Office of the Associate Provost and Director of University Libraries on a review of salaries for librarians and support staff. With assistance from the Affirmative Action Office, some anomalies were identified and a proposal to redress them was submitted to the Provost early in 1984. At the same time, a review was also begun on the relationship of pay to the minority status of library personnel and on the adequacy of the present three-level classification system for support staff jobs. An ad hoc committee was struck in the fall of 1983 to draft an affirmative action plan for the University Library System, and although its plan is not yet ready, the committee has been working closely with another committee which is revising the procedures for promotion and appointment of faculty librarians. Both of these efforts, when completed, should go a long way toward achieving the first part of the above objective.

At present, tasks and jobs in libraries are complex and require a wide variety of skills, ranging from clerical, rote or manual ones, through to those which are highly analytical in nature. Yet the classification system used for library staff jobs designates only three levels of positions. This system is, to put it mildly, antiquated and demoralizing. In late 1983, work was begun, in cooperation with Human Resources, to identify a more natural job classification system for library personnel. When this is completed, all library support staff positions will have to be evaluated, and, if reclassifications warrant, some salary adjustments will have to be made.

As these studies and proposals conclude, it is anticipated that additional funds will be needed for salary adjustments.

INCREASE SUPPORT:	- Librarians' salaries	$125,000
	- Reclassify staff positions	100,000

OBJECTIVE 5: Develop and implement training programs which will enable personnel to take full advantage of new technology and to assist users to make effective use of computers and telecommunications facilities to fulfill their information needs.

INCREASE SUPPORT:- Staff training and development program $ 45,000

GOAL: TO TAKE FULL ADVANTAGE OF COMPUTER AND TELECOMMUNICATIONS TECHNOLOGY TO ACHIEVE THE OBJECTIVES OF THE UNIVERSITY'S LIBRARIES.

In 1981, the Provost's Task Force recommended that "high priority be given to the creation of a comprehensive, on-line union catalog of the holdings of all libraries within the University". While this remains a high priority and is being acted upon, other developments such as the Campus of the Future Project have demanded that a longer and wider look be taken at the information needs of users on a wired campus. As a result of this effort in the first quarter of 1984, the following objectives were accepted by the Campus of the Future Task Force as being priorities (in the order in which they appear). The document which outlines the specific tasks which will be required to reach each objective — and the units within the University which should take responsibility for executing the tasks — is attached as Appendix 4.

OBJECTIVE 6: Provide electronic access to the University libraries' catalogs and indexes.

During 1983/84, a five-year plan was developed for library automation. This plan provides for the automation of library processing functions such as circulation of books and order processes. Subject to enough information being available in computer form, information about what Pitt's libraries own and house should, ideally, be available from almost any terminal or personal computer in any location — on or off campus — to legitimate users. The needs analysis which was conducted in the Spring of 1984 for the network wiring project indicated that one of the most desirable services in the planned network would be to have such access to library catalogs in future (see page 32). At present, such information is only available (and in incomplete form at that) in the "union card catalog" located on the ground floor of the Hillman Library. Plans are to fund acquisition of the required software and hardware in the last half of 1984 and to have the system installed and operating in at least the first phase (circulation) by the middle of 1985.

Aside from the initial investment in hardware and software, the single most expensive AND IMPORTANT factor in providing an on-line catalog at Pitt will be the conversion of approximately 625,000 of the catalog records which are not yet in machine-readable form.

In summary, not only do library users expect and demand computer access to library catalogs, but there will also be increased access to library information resources. Since other libraries and other universities are already using such technology extensively, it is not unlikely that lack of comparable services at the University of Pittsburgh will directly affect the University's ability to attract and retain faculty and graduate students. When a turnkey system is installed, it is anticipated that the present complement of systems staff in the libraries can be reduced by half.

INCREASED SUPPORT:	- Hardware and software purchase	$2,500,000
	- Data Conversion	625,000
REDUCE:	- Number of personnel in Library Systems - Department	100,000

OBJECTIVE 7: Provide direct user access to external data bases containing citations, abstracts, indexes, numerical, statistical and/or textual data files.

This objective strives to make Pitt's students and faculty not just computer literate, but information literate. With the mushrooming availability of microcomputers in faculty and student hands, demand is building for access to commercial on-line information services. Over seven hundred of the needs survey respondents indicated that access to data bases is desirable (see the charts following). There is already a demonstrated need for librarians to help teach people to do their own searches, to help them with down-loading and with organization of the data they receive. Microcomputer software which helps formulate searches off-line and which takes advantage of the attendant savings in on-line time is already available. While many library users will continue to want to use an expert searcher, much of the increase in searching in future will come from direct individual searching of the cheaper, popular and more accessible data bases such as the "Academic American Encyclopedia" and "Magazine Index". A recent study estimates this will be 50 percent of the total searches of data bases in future. Within the University environment, the savings from volume discounts and centralized accounting and control through use of mainframes will need to be thoroughly investigated. Beginning in January, 1985, providing the Hillman Endowment income can be used, an experimental information access center will be established in the Hillman Library which will test the viability of information access services such as "Search Helper" and "Insearch", as well as training methods such as TRAINER.

INCREASE SUPPORT:	- Data base searching by users	$ 50,000
	- Information literacy program - SEE SLIS's PLAN	
SEEK OUTSIDE FUNDS:	- TRAINER development	192,500

OBJECTIVE 8: Provide electronic access to the catalogs and indexes of other libraries within and outside of Pittsburgh.

Access to specialized collections in the region and/or large research collections outside of the immediate Pittsburgh region is especially important to faculty and graduate students. Through utilities such as OCLC, RLIN, and WLN, a scholar's ability to browse the shelves of other libraries, on-line, is virtually limitless. To date, such direct access has been mostly library-to-library for purposes of interlibrary loans. Some libraries, however, do enable users to query these larger data bases directly. Electronic access to C-MU's library catalog will be available in the Hillman Library in the spring of 1984, but at their request, use will be limited to Pitt library staff for the time being.

Such linkages with other data bases was foreseen by the Provost's Task Force to be advantageous not only to Pitt from the point of view of access to information, but also from the point of view of realizing savings through cooperative acquisitions, cataloging and interlibrary loan.

OBJECTIVE 9: Provide electronic access to information sources within the University of Pittsburgh.

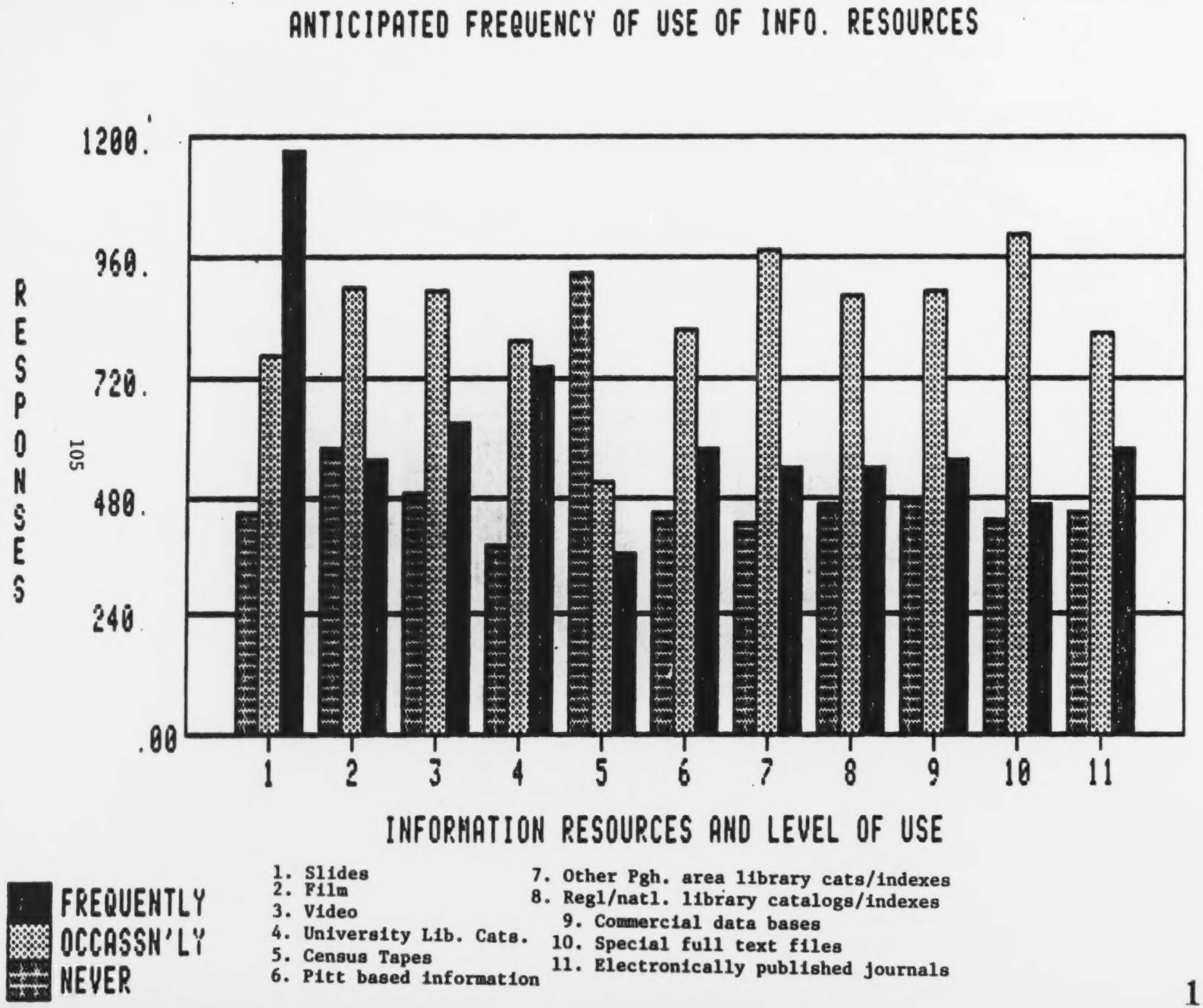
At present, there are many different bibliographical, textual and numerical data files and information sources being maintained, used and generated by various units throughout the University. Many of these could, if known and available to a wider audience, provide a rich resource for faculty and students. Internal, but university-wide, on-line access (or at least listings that turn up on a "literature search") to such data bases could reduce duplication of effort and expense, speed up access to information and enhance interdisciplinary contacts within the institution. For example, NIAC produces a data base of abstracts for U.S. Political Science Departments which they make available through a commercial data base service - Dialog. If a data base search is done in any of Pitt's libraries for users who require this data base, the University pays the commercial data base vendor and telecommunication costs for access to this file. Some other university libraries purchase and mount data files which index - or provide full text of - the journals to which the institutional libraries subscribe. While, so far, this kind of information service is relatively rare, it may become economically viable as costs of computers decrease and telecommunication costs increase.

OBJECTIVE 10: Provide access to the corpus of electronic scholarly information generated by Pitt faculty, researchers and students.

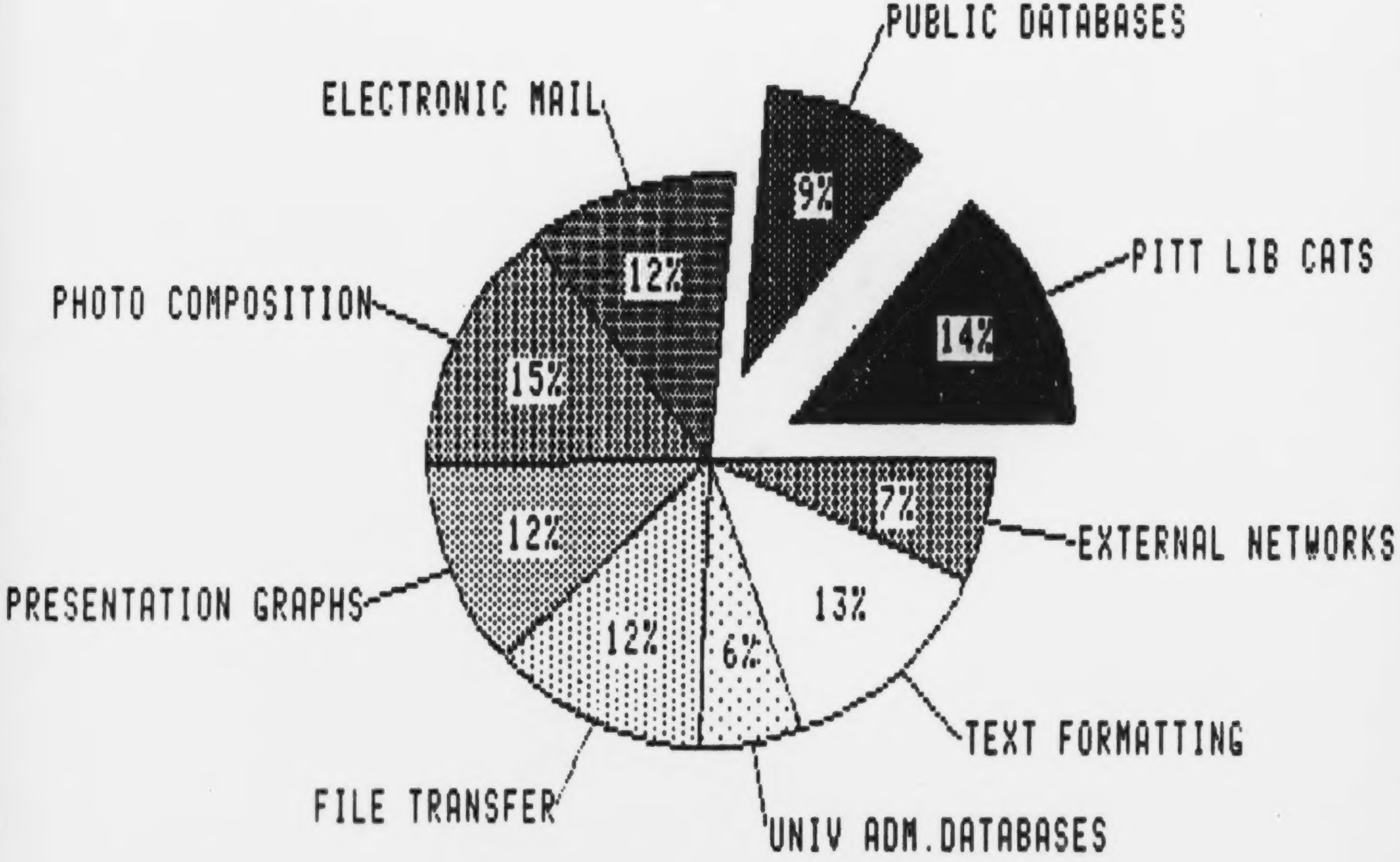
Within a community of scholars as large as the University of Pittsburgh, there are many individuals who generate scholarly output which, if the producers were willing, could be "indexed" and made available electronically within the institution. The results of research projects, papers, presentations, models, tests, CAI programs, statistical data, etc. — the corpus of Pitt's scholarly output -- would provide a unique resource for faculty and students to use. While the concept is fraught with problems, such a pool of information could also do much to improve interdisciplinary research and enrich the invisible colleges of our scholars and researchers. This presumes the availability of a university-wide data network and solution of such knotty problems as copyright protection.

GOAL: CONTINUE TO COOPERATE WITH OTHER LIBRARIES AND TO PARTICIPATE IN MUTUAL USE AGREEMENTS, NETWORKS, CONSORTIA AND OTHER COOPERATIVE AGREEMENTS WHICH WILL SUPPORT AND AUGMENT THE UNIVERSITY OF PITTSBURGH'S LIBRARY AND INFORMATION SERVICES.

As was pointed out in the Report of the Provost's Task Force in 1981, "resource sharing is an important and efficient way of extending any university's library resources." Three years later, this still remains true. In fact, the Task Force report acknowledged that even the largest and richest of libraries cannot afford to be self-sufficient in the provision of the materials needed for graduate student and faculty pursuits. Not only do libraries share the results of their intellectual efforts in processing materials (through bibliographic utilities such as OCLC and RLIN), but they also cooperate through development of union lists, reciprocal lending agreements, shared purchase agreements and document delivery services. Just as Pitt relies on other libraries to supply some of the materials needed, so does Pitt extend itself to supply others' needs and to provide direct lending privileges to individuals in the surrounding community and region. While a small fee is charged for library privileges to those who have no formal affiliation with Pitt, such service is valuable to the University in that it does provide a kind of community service and projects a positive image of the University to the public and the city's corporate world.

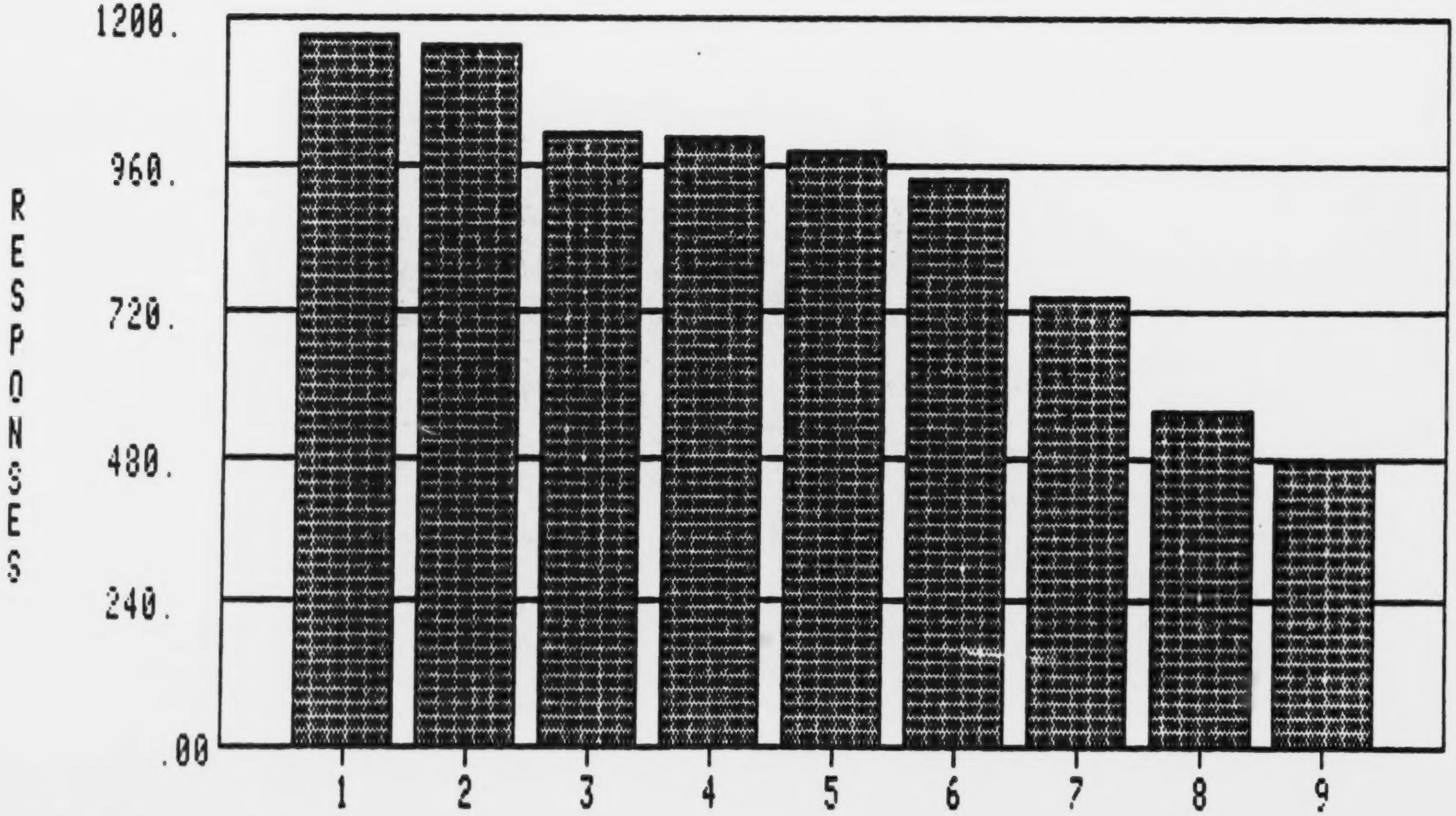

ANTICIPATED FREQUENCY OF USE OF INFO. RESOURCES
RESPONSES
105
1200.
960.
720.
480.
240.
.00
1
2
3
4
5
6
7
8
9
10
11
INFORMATION RESOURCES AND LEVEL OF USE
FREQUENTLY
OCCASSN'LY
NEVER
1. Slides
2. Film
3. Video
4. University Lib. Cats.
5. Census Tapes
6. Pitt based information
7. Other Pgh. area library cats/indexes
8. Regl/natl. library catalogs/indexes
9. Commercial data bases
10. Special full text files
11. Electronically published journals

MOST DESIRABLE NETWORKED DATA SERVICES



Source: Pitt Campus of the Future Needs Assessment question 22

MOST DESIRABLE NETWORKED SERVICES



CODE:

1. Photocomposition
2. Pitt Libraries' Catalogs
3. Text formatting facilities
4. File transfer
5. Electronic mail
6. Presentation graphics
7. Public databases
8. Network links
9. Univ. Admin. Data bases

Total number of responses 4498

Source: Pitt Campus of the Future Needs Assessment question 22

Into the Information Age

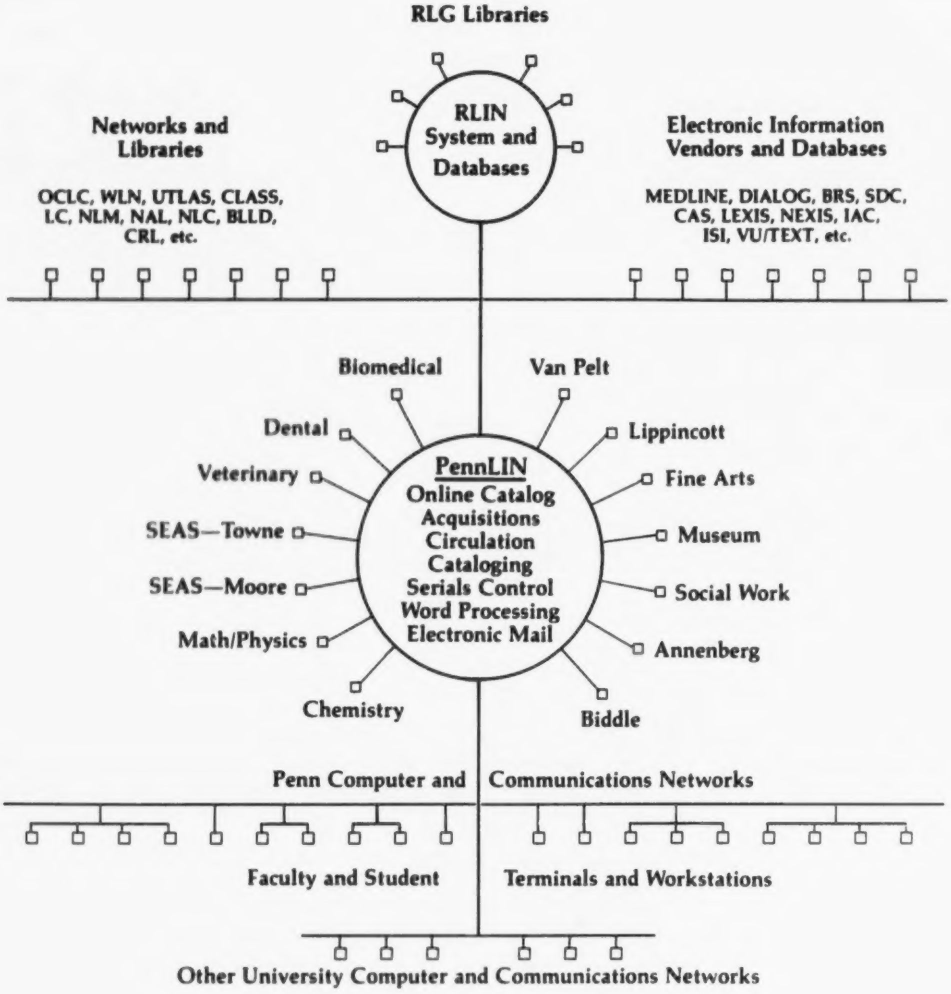
Report of the Director of Libraries University of Pennsylvania, 1982-83

Rittenhouse Orrery

January 17, 1984
Philadelphia, PA 19104

by Richard De Gennaro

The Penn Library Information Network—PennLIN



RLG Libraries
RLIN System and Databases
Networks and Libraries
OCLC, WLN, UTLAS, CLASS, LC, NLM, NAL, NLC, BLLD, CRL, etc.
Electronic Information Vendors and Databases
MEDLINE, DIALOG, BRS, SDC, CAS, LEXIS, NEXIS, IAC, ISI, VU/TEXT, etc.
Biomedical
Van Pelt
Dental
Lippincott
Veterinary
Fine Arts
SEAS—Towne
Museum
SEAS—Moore
Social Work
Math/Physics
Annenberg
Chemistry
Biddle
PennLIN
Online Catalog
Acquisitions
Circulation
Cataloging
Serials Control
Word Processing
Electronic Mail
Penn Computer and Communications Networks
Faculty and Student Terminals and Workstations
Other University Computer and Communications Networks

Last year the President and Provost called upon each School, Department, and Resource Center to submit a five-year plan as part of a comprehensive effort to choose and build Penn's future. Setting priorities, formulating goals and objectives, and writing the Library's Plan constituted a major effort on the part of the Director and the senior administrative staff during the year. A first draft of the Plan was completed and submitted on schedule in October 1983 for review by the appropriate academic officers and committees. That review has not yet been completed and therefore the Plan carries no official approval.

In last year's report, entitled PLANNING AHEAD, I outlined briefly the general directions that the Library's planning would take and asked for (and received) comments and suggestions from the University community. In this year's report I am featuring a considerably revised and abridged version of the October 15 draft to give the Plan wide exposure, invite comments, and pave the way for achieving a broad consensus within the University for its major goals and objectives. There will be no "final" version of the Plan. Planning is a process and the Plan will be revised and updated periodically to reflect changing needs and conditions.

Due to space limitations, a briefer-than-usual summary of the Highlights of the Year 1982-83 will follow the abridged text of the Five-Year Plan.

Into the Information Age: A Five-Year Plan for the Penn Libraries, 1985-1989

I. Introduction and Summary

There is a quiet revolution going on in academic research libraries. It is a revolution that is being driven by powerful economic and technological forces. It started in the 1960s and is now accelerating at an extraordinary rate. By the end of this decade, libraries will be profoundly different from the libraries we have known and used in the past. To be sure, the buildings, bookstacks, and the reading rooms will still be there, but the library will be fulfilling its mission in new ways, and it will be making extensive use of new information technologies.

A parallel revolution in the way universities fulfill their mission is also in progress. The Report of the Academic Computing Committee (*Almanac*, 11/29/83) begins with this statement:

> "Information—its creation, transmission, and retrieval—is central to the function of a large research-oriented university such as the University of Pennsylvania. The changes in technology affecting the methods and economics of collecting, storing, retrieving, communicating, and displaying information will inevitably bring about large changes in the ways we teach, carry on research, and manage the institution. For Pennsylvania to maintain its position of excellence in instruction and research, the University must take advantage of the revolutionary changes occurring in computing."

And for the Library to maintain its position as the University's principal information resource and service it must take advantage of the revolutionary changes occurring in information technology.

The age-old mission of libraries is to collect, organize, preserve, and make available the records of our civilization in whatever form they take. The library function will become even more important in the electronic age than it was in the print age. In the electronic age information will become more ephemeral and will proliferate as never before, and the task of bringing it under control will become more difficult and more vital. Thus, the new information processing technologies, rather than making libraries obsolete as some contend, will revitalize them by enlarging their scope and capabilities. Information in electronic form will become increasingly important and will replace the print versions of many indexing and abstracting services, but it will not make books and journals obsolete in the foreseeable future.

The challenge to librarians in the decade ahead is two-fold: 1) to computerize their public catalogs and internal operations and develop the capacity to deal with large quantities of information in a variety of new electronic forms, and 2) to continue to strengthen and provide for the growth of their traditional collections and services. The challenge to those who fund libraries is to provide the financial resources that will be needed to accomplish this two-fold task. This Five-Year Plan shows how Penn's librarians plan to meet this challenge and calls upon the University for the necessary financial support and intellectual commitment.

The first goal of the Plan is to implement a comprehensive program for using new computer and communications technologies to add a new electronic dimension to the library's traditional collections and services. The Plan sets three objectives to accomplish this goal: 1) to build a Penn Library Information Network (PennLIN) and online public catalog, 2) to convert the Library's card catalogs to machine-readable form and make their contents accessible on the online catalog, and 3) to improve the Library's capacity to provide access to scholarly resources in other libraries and in electronic as well as traditional print forms.

The cost of implementing this plan for new technology over the next five years will be high—an estimated $3.8 million—and the cost of operating the libraries with this added dimension will increase. We do not propose making this major investment in new technology to reduce costs, but to give the Library the means to meet the changing needs of a University which must maintain its competitive position in an information society. If the Library fails to keep pace with new information technology, its past investment in collections and services and its role as the University's principal information resource will be seriously undermined. In that event, other means of meeting the University's growing needs for dealing with information in electronic form will have to be developed outside the Library—and probably at a much higher cost.

Adding this technological capacity to the Library is essential, but it is no substitute for continuing to build and maintain strong collections, services, and physical facilities. Therefore, the second goal of the Plan is to strengthen the Library's traditional collections and services and improve its physical facilities.

The Plan sets three objectives to accomplish this goal: 1) to strengthen the book and journal collections by doubling the Library's endowment funds and increasing its annual book appropriations to keep pace with inflation, 2) to restore 12 positions to the Library's budget over the next five years in order to improve services and staff new libraries, 3) to provide for the growth of the collections and the changing needs of users and staff by improving and making more intensive use of existing library space. An estimated $4 million will be required to accomplish this second goal.

We look largely to private sector sources for the estimated $7.8 million required to fund all of the Plan's major goals and objectives.

II. The Library in Transition

Thomas Carlyle's much-quoted statement, "the true university of these days is a collection of books," may have been true in his day, but it is not true today. We have entered the electronic information age where universities and the libraries that serve them must be much more than collections of books. The mission of universities is to create and communicate knowledge, and libraries play a vital role in that process. Knowledge is being created and communicated at expanding rates and in new ways and this is causing profound changes in both the economics and technology of libraries.

During the last ten years the Penn Library (along with many of its peers) has been experiencing a serious erosion in its level of support and, therefore, in its ability to provide traditional collections and services. With each passing year, the Library's inflation-ravaged book and journal budget is less capable of sustaining the quality and scope of its research collections. In the past decade U.S. periodical prices have quadrupled and hardcover book prices have tripled. During the same period the Library's book and journal expenditures only doubled. The price of scholarly books and journals continues to rise at an average rate of approximately 15 percent a year. The Library's rate of acquisition dropped 20 percent since 1970 from 100,000 volumes a year to 80,000. Meanwhile, the number of books and journals published in the U.S. and abroad continues to increase at record rates. The Library spends more money every year to buy an ever-decreasing percentage of the rapidly growing output of the world's publishers.

A parallel erosion of staff positions has occurred in the last decade when one out of every six positions was cut from the Library's personnel budget. The result is a chronic staff shortage which is one of the Library's principal administrative concerns.

The most damaging consequence of these staff cuts and the erosion of book and journal funds is that there are no slack resources in the Library which can be reallocated from one function to another or used to implement new programs and services. Thus, at the very time when the Library is struggling to maintain its book and journal collections and service functions in the face of inflation and eroding support, it must computerize its remaining manual operations, put its card catalogs online, and expand its capacity to deal with information in a variety of electronic forms. In short, the Library is experiencing severe economic pressures at a time when the information explosion and the computer and communications revolution are increasing the number and variety of demands being made on it.

The combined effects of these economic and technological forces are causing a fundamental change in the way libraries support teaching and research and in the way library budgets are being allocated and spent. Until this decade, collection building and growth were the dominant driving forces in academic research libraries. Libraries were ranked by the size of their collections, and bigger was always better and more prestigious. The job of the library director was to get and spend as much money as possible for books and journals, to provide the space in which to house them, and the staff to acquire and service them. And as far as faculty and academic administrators were concerned, spending library money on books and journals was good, while spending it for any other purpose was bad, or at best, a regrettable necessity.

From Collections to Access

The emphasis in libraries has begun to shift from collections to access. Providing access to resources and coping with technology and change will be the principal driving forces of the library of the future. Those who use libraries, and those who provide their financial support must recognize and accept this new reality. The explosion in the quantity, cost and communicability of information is a new phenomenon which calls for new responses. Chief among these responses must be a willingness to embrace appropriate new technology and accept change. It should be clear to all by now that no research library can meet its users' needs solely, or even largely, from its own book, journal, and manuscript collections.

The economic and technical developments of the 1970s have convinced librarians of the need to use the new technology to restructure the university library to function as part of a national and international network of research libraries. The academic community must also reassess its concept of the research library in this time of transition. We need to develop a new consensus about how the Library should fulfill its mission, how it should be funded, and how its funds should be allocated in the changing environment of the 1980s and beyond. Faculty and administrators must accept and support the Library's growing need to spend money, not only for traditional books and journals, but also for computer systems, telecommunications, network participation, and to pay the various charges and fees that go with obtaining access to information in new ways and in new forms.

Library and information services will cost more in the future than they do now, but they will be far more effective. The pattern of expenditures will change and an increasing proportion of the Library's funds will go for new technology and access services. The acquisitions budget must be increased substantially and its function expanded to include acquiring and providing access to collections of information in electronic form. The Library will have to rely increasingly on the collections and services of other libraries, library consortia such as the Research Libraries Group, and commercial information vendors. This will require additional and more highly skilled staff in some areas.

The Director and his associates Joan Gotwals and Bernard Ford.

Economic pressures are making it necessary, and technological advances are making it possible, for Penn librarians to locate and deliver a wide range of books and journals that we do not own or cannot acquire for our own collections. The large online databases and the powerful communication systems that RLG and other library networks make available to us are reducing interlibrary loan delivery time from weeks to days. The electronic text delivery systems that are being developed and tested promise to reduce document delivery time to a matter of hours and minutes before the end of this decade.

Penn's participation in the RLG East Asian program provides a good example of technology-assisted resource sharing in action. This important program is based on RLIN's new capability for processing Chinese, Japanese, and Korean (CJK) vernacular language records. The initial cost of the special computer equipment and the annual telephone line charges will be significant. However, our participation in this program will, in time, give our East Asian scholars access to the combined resources of all the other CJK network participants. Included among them are the Library of Congress and sixteen of the most important East Asian collections in the U.S. and Canada.

Resource sharing is a supplement to, and not a substitute for, strong working collections in the Penn Libraries. We turn to resource sharing from necessity, not from preference. The reality is that most of the routine needs of most library users must continue to be met from the Library's own collections in the future as they have been in the past. However, the interests of researchers are expanding and a growing proportion of their occasional, special, and peripheral needs will have to be met from external sources. In addition, an increasing amount of information will only be available in electronic form. In the future, the excellence and usefulness of the Library will be measured not only by the size and quality of its own collections, but also by the range of resources that its staff is able to deliver to users by conventional and electronic means from a growing variety of sources. Users will no longer be limited to what the Library has, but to what it can provide.

Technology in the Penn Library

The Penn Library's experience with new technology goes back to 1967 when it developed a system to computerize the Van Pelt Library's circulation control procedures. In 1977 the successor to that system was replaced by the current vendor-supplied online circulation system.

The Library's first network affiliation was with OCLC, Inc. from 1973 to 1979. Penn joined RLG in 1979 as its sixth member and became a strong supporter of close cooperation and joint development with other major research libraries. RLG is corporation owned and operated by its 27 members. The partnership was founded in 1974 to provide a framework within which these institutions could seek cooperative solutions to the fiscal, staffing, and support problems common to all research libraries. Through its four major programs—Shared Resources, Collection Management and Development, Preservation, and Technical Systems and Bibliographic Control—the consortium is working to create an open-ended system of software, hardware, cooperative agreements, and coordinated procedures that will enable libraries to fulfill their traditional mission of collecting, organizing, preserving, and providing information to scholars, researchers, and students. Its central offices and computer facilities are located at Stanford University.

The principal means of participating in RLG's programs is through RLIN (Research Libraries Information Network). Catalog copy most of the books and journals acquired in the last ten years by Penn and the other member libraries is now in RLIN's central online data base which now exceeds 12 million records. Thus, RLIN provides an online catalog of those resources with powerful subject search capabilities and an efficient electronic communications system. Penn's RLG/RLIN participation has greatly improved interlibrary lending, shared cataloging, and reference work. Penn's increasing use of its 18 RLIN terminals (including those in the Biomedical, Lippincott, and Biddle Law libraries) is transforming the way we operate our libraries and serve users.

Except for the terminals that are at the Reference and Interlibrary Loan desks, the RLIN system is still relatively unfamiliar to library users. In contrast, the online CLSI circulation system is highly visible to all users of the Van Pelt, Lippincott, and Fine Arts Libraries. There are 24 terminals on the system, and several of them are located in the stacks and at public service desks where users can consult them directly for information about the loan status of books. In addition to our use of RLIN and the CLSI online circulation system, the reference librarians in the various Penn libraries do several thousand computer searches every year on MEDLINE, DIALOG, SDC, BRS, and a number of other commercial online data bases. The Library's use of online computer and communications technology is becoming commonplace and is expanding the range and quality of library services to users.

The Penn Library has laid the foundation and taken a number of important and successful steps toward automating various library functions, but much remains to be done. The next part will outline the major goals and objectives of the Library's Five-Year Plan.

III. Goals and Objectives

The first goal of this Plan is to implement a comprehensive program for using computer and communications technologies to add a powerful new electronic dimension to the Library's traditional collections and services.

The following three objectives are designed to achieve this goal:

1. PennLIN

To build a comprehensive computer network and online catalog which will link the 14 units of the University Library into a coordinated Penn Library Information Network with interfaces to RLIN and the Penn computer and communications network.

This Penn Library Information Network (PennLIN) will provide the necessary technical infrastructure for automating the Library and making its catalogs accessible from the growing array of workstations and personal computers on the campus computer and communications network. Its two main functions are: 1) to provide a comprehensive online system for handling all the Library's internal operational needs, including acquisitions, cataloging, serials management, and circulation control, and 2) to provide an online public access catalog of essentially all the holdings of the Penn libraries.

At the present time the card catalog of each library exists only in that library, and users must go there to consult it. The online catalog that will replace them will be far more accessible and versatile. It will be accessible, via the campus communications network, not only from terminals in the libraries, but also from student residences and faculty offices and homes. From these same terminals, users will in time be able to access the RLG data base, as well as other electronic catalogs and commercial information services and data bases. The online catalog will profoundly change the way the libraries are operated and used in the future. It will not only replace the card catalogs, but it will provide a system that will unify the now physically separate Penn libraries into a single comprehensive library and information network.

Another important aim of PennLIN is to make the resources and capabilities of RLG and RLIN easily available to all Penn libraries and their users. At the present time, only the three larger units in the system have direct access to RLIN. The Plan calls for placing RLIN terminals in all the libraries and making each one a full participant in both PennLIN and RLIN. This will improve services to users in all schools and departments and unify the libraries into a coordinated information service.

RLG's *Carnegie Study on Distributed Computing* (November 1983) surveys and evaluates the computer systems that are available to provide the PennLIN functions. It concludes that while no single existing vendor system offers all the features that RLG libraries need, there are three which are acceptable now and will be further improved in the next year or two.

The *Carnegie Study* also provides useful estimates of the costs of acquiring, implementing, operating, and maintaining the three recommended systems. For purposes of this Plan we are assuming that a system suitable for Penn's needs will cost an estimated $900,000 for the hardware and software. The annual maintenance costs, together with the salaries of two systems specialists will cost an estimated $600,000 more. We envisage a phased implementation of the various components of the PennLIN system during the course of the planning period.

The total cost of purchasing, maintaining, and staffing the PennLIN system during the first five years is estimated at $1.5 million.

2. Catalog Conversion

To convert most of the records in the Library's card catalogs to machine-readable form and make them available in the PennLIN online catalog and the RLIN database.

The Library has made a heavy investment during the last two centuries in acquiring, cataloging, and preserving its older book and journal collections. Those collections become more valuable with the passage of time. They give the Library distinction and our circulation records show that they continue to be used. It is therefore essential that we convert the card catalog records of these older collections into machine-readable form and make them available on PennLIN. If those books—and especially the ones in the Special Collections closed stacks—are represented in the online catalog, they will continue to be used, and if they are not, they may be overlooked by users and our investment in them will be lost. Experience with online catalogs shows that once an online catalog is available—even a partial one—most users will prefer it and avoid using the old card catalog. In short, the online catalog will be the first, perhaps the only, choice of many readers, and it must therefore be as complete as possible.

Converting library catalogs to machine-readable form is now feasible, thanks to the availability of the 12 million record RLIN data base and the 5.1 million records in the Library of Congress shelflist which are also accessible. We plan to make maximum use of these large data bases and new conversion capabilities in order to avoid or minimize the costly task of keyboarding our own catalog records. When all its bibliographic records are in the PennLIN online catalog, the Library will be able to phase out its card catalogs and manual procedures and go to a fully automated library support system.

There are an estimated 1,750,000 catalog records representing the more than 3.1 million book and serial volumes in the University Library system. The records of all titles currently being cataloged as well as 300,000 titles cataloged since 1973 are in the RLIN data base and are available on magnetic tape. They will form the nucleus of the PennLIN online public catalog.

During the next five years we plan to convert most of the remaining records to machine-readable form in a carefully managed and phased project. We will begin with the most important and most-used categories of records such as those for journals and serials. When these records are added to the PennLIN and RLIN data bases, users will have online access to most of the Library's active collections.

The Dewey classed books that were acquired before 1950 were frequently not cataloged to acceptable standards, and we will take this opportunity to recatalog and transfer many of them to the LC section of the stack. However, we anticipate that some 400,000 of these older records will pose significant problems and will be set aside for special handling in the future.

The total cost of the Catalog Conversion Project is estimated at $1.8 million.

3. Electronic Access to Resources

To use new technology to enhance the Library's capacity to provide access to scholarly resources in other libraries as well as to the growing universe of information in electronic form.

Strengthening our local collections is critical, but we cannot possibly acquire everything our users will want or need. Other approaches to making resources and information in other libraries accessible to our users must be further developed and expanded. Computer assisted interlibrary loan through the RLG/RLIN system is becoming an increasingly important source of materials the Library does not own and cannot purchase. The Library plans to enhance this capability by installing a telefacsimile system.

The quantity of research information available in electronic form is growing rapidly. Since 1975, over a thousand databases have been made available online through commercial vendors, professional organizations, and learned societies. Online searching of abstracting and indexing services is becoming the preferred way of doing literature searches.

In the next five years, a number of important new information technologies will come into use and will have an extraordinary impact on libraries and the research process. Prominent among these will be powerful workstations and new optical and video laser disk technologies which will reduce dramatically the cost of storing and retrieving vast quantities of text in electronic form. Some vendors are already preparing to market systems featuring the full text of hundreds of journals mounted on optical disks and linked to personal computers. Others will provide online access to massive files of text through advanced telecommunications facilities.

The Library must begin to develop the capacity to acquire and make available to users selected files and collections of research data and other information in electronic form. However, in most cases it will be impossible to acquire the data, and access to it will be provided to users on demand. The question of who will pay these costs is an important policy issue which will have to be resolved. The Library will continue its present policy of partially subsidizing these new services to encourage their use and gain experience with them.

The library staff will also have to keep users informed about new electronic information sources and teach them to do online searches on their own personal computers and terminals. New commercially available computer programs make this possible for users with a serious interest.

We estimate that the staff, equipment, and related costs involved in developing and providing the capacity required to accomplish this objective will be in the order of $500,000 during the next five years.

The total cost of implementing this first goal and its three objectives is estimated at $3.8 million.

The second major goal of this Plan is to strengthen the Library's traditional collections and services and improve its physical facilities.

The following three objectives are designed to achieve this goal:

1. Collections

To strengthen the Library's book and journal collections by doubling its endowment funds and increasing its annual book appropriation to keep pace with inflation.

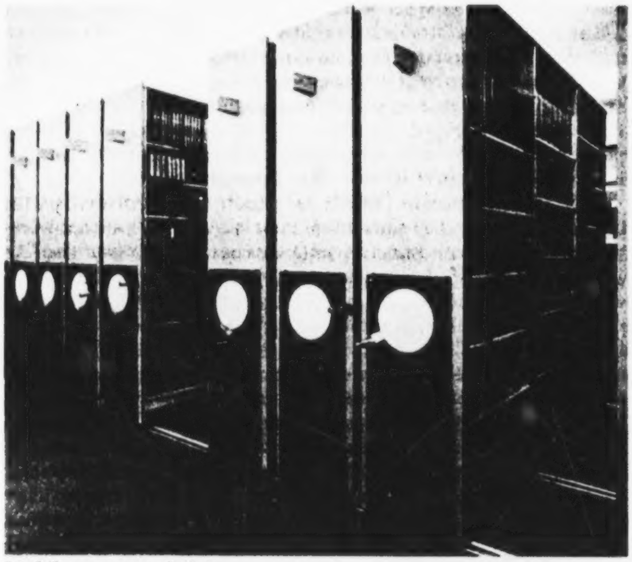
The new information technologies will increase greatly the quantity and range of research resources available to library users, but they are no substitute for continuing to build strong traditional collections and services. The Library's book, journal, and manuscript collections are and will continue to be the mainstay of our Library and its services to users through this decade and the next. We cannot build our new computer-based information capabilities at the expense of our traditional collections and services; we must do both. This Plan calls for a major fund-raising drive to double the Library's endowment Funds—i.e., to increase them by $3 million. It also calls on the University to increase the Library's book appropriation annually at a rate sufficient to keep pace with the rate of inflation in book and journal prices. That rate has been approximately 15 percent a year for the last decade.

2. Staffing

To restore 12 positions to the Library's budget over the next five years in order to improve services and staff new libraries.

In the last decade the number of budgeted positions in the Library was reduced from 288 to 244, a loss of 44 positions or 15 percent of the total. These staff reductions were forced by drastic cuts in the Library's personnel budget during the 1970s and especially from 1975 to 1978. Some of these staff reductions were accomplished by merging three departmental libraries and others by eliminating positions in Technical Processing. In addition, a number of key positions in public services were lost from Van Pelt and several of the departmental and professional school libraries. These losses were painful when they were made, but they are being felt even more acutely now as demands on the libraries increase. With one out of every six positions gone, the library staff is working under great pressure to maintain collections and services at adequate levels and to meet the rising expectations and demands of students and faculty. Two specific examples will help to make this point.

During the last several years the number of students in the School of Engineering and Applied Sciences tripled while the staff of the two SEAS libraries was reduced from seven to five positions. The Dean of SEAS and the Director of Libraries are committed to merging the School's two libraries into a new and enlarged space in order to serve better the needs of an expanding school. An enlarged SEAS Library cannot be operated effectively without additional staff. Similarly, a new library building is being planned to accommodate the Veterinary School Library. The present staff of two will not suffice to meet the needs and expectations that will be created by the new building.



Mobile compact shelving

As Penn's librarians succeed in increasing the variety and quality of the traditional and computer-based services available to library users, they stimulate more use and raise expectations. Thus, success can turn into failure unless more staff is deployed to meet the increased demands.

In sum, the Library cannot continue to fulfill its usual functions and make the crucial transition to the more complex and demanding information and service environment of the 1980s at the current inadequate staffing levels. The Plan calls for the restoration of 12 positions at the rate of a few each year during the next five years. The total additional funds required for salaries and benefits are projected at $400,000.

3. Space and Facilities

To provide for the growth of the collections and the changing needs of users and staff by improving and making more intensive use of existing library space.

The space needs of the central library and each of the departmental and professional school libraries are distinctive and will be met in different ways. Although all these libraries (except Law) are under the administration of the Director of Libraries, responsibility for providing and maintaining their physical facilities rests with the department or professional school in whose building they are located. The central library administration assumes responsibility for maintaining and replacing library equipment and supplies and, when funds are available, it will make minor renovations to improve library services. However, there is no provision in the Library's budget for funds to purchase, maintain, or replace furniture, shelving and other equipment or to make the frequent minor building alterations that are required to keep Van Pelt and the other libraries responsive to changing needs and conditions. A special Furniture and Renovation Fund for this purpose is described below.

Four professional schools will re-house their libraries in new buildings or additions in the next five years. They are the Annenberg School, the School of Engineering and Applied Science, the Veterinary School, and the Dental School. The Medical School may build new quarters for the Biomedical Library within a decade. These various building projects and plans will meet the space needs of the major professional school libraries and make it unnecessary to provide a centralized storage facility to accommodate the growth of their collections during the next ten years.

Van Pelt Library's Space Needs

The Van Pelt building is a large and functional central library facility with 400,000 square feet of floor space. It was built in the 1960s and continues to meet the University's needs. Reader space is adequate now, and since no increase in enrollment is anticipated in the coming decade, no additional reader space will be required.

The book stacks, however, are nearly filled to capacity with over two million volumes, and this plan outlines a strategy for accommodating the anticipated growth of the collections during the next ten years. We anticipate a stable or even slightly declining rate of growth in the Van Pelt collections during the next decade. This means that we will have to provide shelf space for a net increase of 400,000 volumes. This is a serious problem, but it appears to be manageable.

In 1978, to free space in Van Pelt, Lippincott, and SEAS libraries, the Library leased one 8,000-square-foot floor in a University-owned warehouse at 4015 Walnut Street. A miscellaneous array of used shelving was installed and filled with space-consuming folio volumes, long runs of older science journals, and other lesser-used materials from Van Pelt and a number of other libraries. A second floor was leased in 1982 and additional materials are being transferred. Having this storage space has made it possible to reorganize and make more efficient use of the space in the Van Pelt stacks. However, once the obvious materials have been stored, it will become more difficult and expensive to select, process, and service materials in off-site storage. These difficulties will be considerably mitigated in the future by the use of the online catalog.

An attractive interim alternative to off-site storage is to make much more intensive use of the space within the Van Pelt building. This Plan calls for installing mobile compact shelving in one part of the closed stacks of the Van Pelt Special Collections Department and in one area on the fifth floor. In the future, various other installations will be made in public and non-public areas of Van pelt as the need and opportunity arise. In mobile compact shelving, the stack ranges are mounted on platforms and tracks. These ranges can be pushed together tightly, making it possible for one moveable aisle to serve a number of ranges. Mobile shelving is costly, but it more than doubles the shelving capacity of a space with no corresponding increase in the cost of maintenance and utilities.

This plan to install mobile compact shelving is a useful interim solution to the Library's need for additional shelf space, but a satisfactory long-term plan must be formulated during the next five years.

Furniture and Renovation Fund

The Plan calls for the establishment of a Furniture and Renovation Fund to provide the Library with approximately $200,000 during the planning period. It will be used for the maintenance and replacement of worn-out furniture and equipment and for making minor building renovations and alterations. With imaginative planning and relatively modest expenditures, we can make the Van Pelt and other libraries continue to serve the needs of staff and users during this period of change and transition. Three major installations of mobile compact shelving are planned for the Van Pelt building at an estimated cost of $400,000.

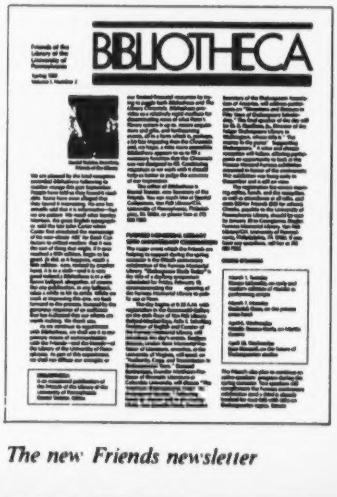
The total expenditures for shelving, furnishings, and building renovations will amount to approximately $600,000 over the next five years.

IV. Summary of Funding Requirements

Implementing New Technology:		
1. PennLIN	$1,500,000	
2. Catalog Conversion	1,800,000	
3. Electronic Access to Resources	500,000	
		$3,800,000
Strengthening Collections and Services		
1. Collections	$3,000,000	
2. Staffing	400,000	
3. Shelving and Furnishings	600,000	
		$4,000,000
	Total	**$7,800,000**

The Plan assumes that the funds required to accomplish the Plan's goals and objectives will come largely from private sector support through the University's current development program, *Building Penn's Future*. However, we look to the University to provide the funds to increase the book budget to keep pace with inflation and to restore 12 positions.

The Plan also assumes that the ongoing costs of maintaining and operating the Library's new technological capabilities and other Plan initiatives will become part of the Library's regular operating budget in FY1990 and beyond.



The new Friends newsletter

Annual Report Highlights, 1982-83

Financial Support

"How are things at the Library?" That's the way many faculty colleagues greet me when they meet me on campus. I wish I could give the kind of simple answer that the Librarian of Harvard College, John Langdon Sibley, gave to President Eliot when he greeted him with that question over a century ago. Mr. Sibley's response was, "All the books are on the shelves where they belong—except two; I know who has them, and I am on my way to fetch them now." But things are not that simple anymore. I know that my faculty colleagues are not asking about the state of the books, but the state of the Library's budget. That is why I usually begin this annual report with a brief note on the Library's recent budget experience.

The Library's Current Expense allocation, which includes books, journals, binding, access, etc., was increased by 6 percent in 1981-82, a generous 20 percent in 1982-83, and nearly 10 percent in the current budget year, 1983-84. We have asked that next year's allocation be high enough to permit us to keep pace with the continuing 15 to 20 percent inflation rate in book and journal prices.

Another question that I am frequently asked by concerned faculty colleagues and library committees is how the Penn Library ranks with other members of the Association of Research Libraries (ARL). To respond to this question, I occasionally show in these reports Penn's position in the rank order tables published annually by ARL. I do not intend to deal with this subject in detail in this year's report, but I will call attention to an important new ranking that was added to the ARL tables in 1981-82.

This new table lists Library Expenditures as a Percent of University Expenditures Among University Members of ARL. In 1981-82 the Penn Library's percentage of the University's expenditures was 2.7 percent. This ranks us in the fourth quarter (80th) among the one hundred university members of ARL. The 1982-83 table is not yet available, but the figure we reported for Penn declined to 2.5 percent. In previous years, the percentage of University expenditures devoted to the Library fluctuated at around 2.9 percent. There is no accepted standard, but four percent is considered to be good, and five percent is outstanding for ARL libraries. In the last decade the Penn library has never exceeded three percent.

Some other Penn Library rankings in the 1982-83 ARL Statistics are: Volumes in Library—20th; Volumes Added—38th; Total Staff—32nd; Materials Expenditures—54th; Salaries and Wages—25th; Total Operating Expenditures—29th.

BIBLIOTHECA and the Friends

With R. Jean Brownlee, professor emerita and former dean of the College for Women, as Chairperson, and with Daniel Traister as Secretary, the Friends of the Library have had their most active year ever. I will not use this space to report on Friends activities because they have been widely and effectively reported in *BIBLIOTHECA*, the new Friends newsletter which began publication in the Fall of 1982. Edited by Mr. Traister, *BIBLIOTHECA* appears two or three times a year and is distributed widely within and outside the University as well as to the Friends membership. It carries news about the Library and announcements of major gifts of money and collections as well as items of special interest to the Library's Friends and prospective Friends. It is well-written and has been enthusiastically received.

The publication of *BIBLIOTHECA* gives the Library another and sometimes more effective means than the Library *CHRONICLE* and these brief *Highlights* for communicating with our friends and users.

On the Move Again—The Music Library

In May 1983 the Albrecht Music Library, under the direction of Dr. John H. Roberts, was moved from the fifth floor of Van Pelt to newly renovated and remodeled quarters on the west end of the fourth floor. The attractive new facility is more spacious than its former quarters and much more conveniently arranged. To the relief of all who regularly use it, the collection of books and music, previously divided among several stack locations, has been brought together in one place. In the Music Listening Room a closed-stack system has been introduced, permitting better control and preservation of our holdings, and a much-needed area has been provided for the staff. Other amenities include a separate microform reading room and an electronic piano for score reading. After several moves over the last two decades, the Music Library has at last found a home worthy of the distinguished department which it serves.

RLIN Acquisitions and Cataloging

The RLIN Acquisitions System, which was successfully implemented this year, enables the staff to order all library materials online and provides instant status information for any book on order and not yet cataloged. The transition to RLIN was smooth and all manual ordering was quickly eliminated. The staff is now adding all series titles to the data base and when that has been accomplished the ordering and receiving functions will be fully automated.

Cataloging productivity increased significantly in 1982-83, especially in the Copy Cataloging Unit. One reason for this was the growing acceptance of RLG member library records for cataloging. This increases the number of titles that can be processed by support staff, and allows professional catalogers to devote more time to original cataloging. The improved performance of the RLIN system, a result of continuing technical upgrades, also contributed to the increased cataloging output.

The Class of 1932 Gift

The Class of 1932, reinforcing a trend that we would like to see become a tradition, designated its 50th Reunion gift of $100,000 for a fund to purchase books for the University Library. A plaque commemorating the Class and its gift has been placed on the main floor of Van Pelt Library. In addition, a bookplate will identify each volume purchased from the fund.

The classes of 1924, 1926, and 1928 also gave their 50th Reunion gifts to the University Library and were similarly commemorated.

Personnel Notes

Several noteworthy retirements occurred. Lyman Riley, Assistant Director for Special Collections, retired after 30 years of service; Eleanor Allen, Librarian of Lippincott Library, retired after over 40 years; Shifra Rin, who was responsible for the selection and cataloging of all Hebrew materials, retired after 20 years; Mary Crozer, head of Serials, retired after 42 years; Martha James, assistant head of Serials, retired after 22 years; and Pearl Polo, Manager of the Director's Office, retired after 16 years.

Susan Kallenbach resigned her post as head of Cataloging to accept a position as head of technical services at New York University. The two parts of the cataloging operation were combined into a single department and Susan Jacobson, formerly head of Copy Cataloging, was promoted to fill the expanded position. Irene Coffey resigned her post as head of the Circulation Department to devote more time to her family and was succeeded in that post by Patricia Renfro. Jean Farrington was promoted to succeed Mary Crozer as head of the Serials Department. Carol Carr joined the staff as head of the Chemistry Library.

Daniel Traister succeeded Lyman Riley with the title Curator of Special Collections. Georgianna Ziegler was promoted from her position as Assistant Curator, to Curator, of the Furness Library.

A Note of Thanks

This report is about technology and change, but it is also about people. It is about Penn Library people working and planning to make the University Library a more useful and responsive tool for other Penn people—now and in the years ahead. I am grateful to the library staff at all levels for creating and maintaining the kind of working environment that enables us to plan ahead and have the confidence that we can and will achieve our goals.

I am also grateful to the large number of people who made gifts and supported the Library in a variety of ways during the year. Space limitations make it impossible to list and acknowledge them individually in this report, but I take this opportunity to extend my warm and sincere thanks to all who befriended the Library.

Annual Statistics, University of Pennsylvania Libraries, 1982-83
Report of the Director of Libraries

Growth and Use of the Collections 1982-83

	Volumes 7/82	Added	Withdrawn	Net Adds	Total 6/83	Microfilm	Microcard print/fiche	Home Circulation
Van Pelt	1,980,889	46,806	1,561	45,245	2,026,134	66,359	1,011,449	173,462
Annenberg	17,922	922	75	847	18,769	587	5,346	30,002
Biddle	313,268	7,665	1,072	6,593	319,861	1,410	170,031	N.A.
Bio-Medical	134,644	5,167	481	4,686	139,330	——	——	17,355
Chemistry	14,837	753	140	613	15,450	——	——	542
Dental	43,289	1,538	478	1,060	44,349	85	——	26,451
Fine Arts	75,962	3,113	20	3,093	79,055	234	40	30,633
Lippincott	185,541	4,972	2,296	2,676	188,217	3,152	91,449	30,513
Math-Physics	47,680	1,484	1,407	77	47,757	——	——	9,004
Museum	80,053	1,936	95	1,841	81,894	60	——	13,599
SEAS—Moore	21,688	1,021	133	888	22,576	38	318	8,285
SEAS—Towne	72,057	1,142	1,977	835-	71,222	35	172,000	7,762
Social Work	35,207	1,486	769	717	35,924	75	——	8,276
Veterinary	31,197	1,242	2,001	759-	30,438	——	——	7,804
TOTAL	*3,054,234*	*79,247*	*12,505*	*66,742*	*3,120,976*	*72,035*	*1,450,633*	*363,688*

Expenditures 1982-83

	Salaries	Employee Benefits	Books	Binding	Current Expense	Total
Van Pelt	2,871,273	693,654	873,168	178,051	856,304	5,471,450
Annenberg	127,456	29,188	27,924	4,070	4,496	193,134
Biddle	416,529	102,276	253,672	13,268	71,317	857,062
Bio-Medical	508,310	119,772	324,888	15,567	82,253	1,050,790
Chemistry	31,861	6,442	41,488	5,237	——	85,028
Dental	103,877	25,864	57,276	4,296	3,377	194,690
Fine Arts	215,345	52,085	71,229	20,875	10,122	369,656
Lippincott	489,816	116,560	135,152	18,065	21,468	781,061
Math-Physics	49,696	11,543	79,259	7,370	860	148,728
Museum	69,777	16,454	33,351	8,683	1,270	129,535
SEAS	100,161	23,092	133,917	9,316	6,019	272,505
Social Work	70,361	16,733	17,431	4,011	1,108	109,644
Veterinary	71,762	16,463	59,631	7,233	6,419	161,508
TOTAL	*5,126,224*	*1,229,126*	*2,108,386*	*296,042*	*1,065,013*	*9,824,791*

Five-Year Summary Statistics 1979-83

Growth and Use of the Collections 1979-83

		1978-79	1979-80	1980-81	1981-82	1982-83
Volumes added (gross)		80,068	75,587	74,473	71,135	79,247
Volumes added (gross)		68,224	53,503	55,760	53,584	66,742
Total volumes		2,885,387	2,938,890	3,000,650	3,054,234	3,120,976
Circulation	—Van Pelt	199,152	192,638	189,395	174,564	173,462
	—Total	397,040	389,195	382,837	359,448	363,688
Interlibrary Loan						
Volumes	—Lent	7,767	6,994	3,659	4,173	4,050
	—Borrowed	3,501	3,637	4,866	4,174	4,904
Photocopies	—Sent	5,733	5,792	4,451	3,669	4,644
	—Received	3,175	3,438	3,274	3,242	3,392

Expenditures 1979-83

	1978-79	1979-80	1980-81	1981-82	1982-83
Salaries	3,679,420	3,997,284	4,357,706	4,750,748	5,126,224
Personnel Benefits	893,573	903,861	1,015,542	1,066,184	1,230,126
Books	1,471,368	1,769,604	2,051,440	1,915,557	2,108,386
Binding	238,218	416,791	458,786	359,551	296,042
Current Expense	532,592	754,726	809,512	906,927	1,065,013
TOTAL	*6,815,171*	*7,842,266*	*8,692,986*	*8,998,967*	*9,825,791*

Selected Sections

The University of Western Ontario

University Library System

THREE YEAR PLAN

1984-85 to 1986-87

October 11, 1983

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IV. STRATEGIC OBJECTIVES AND PLANS

A. INTRODUCTION

This section of the Three Year Plan for the UWO Libraries includes a statement of:

B. The Present Situation

Where the Libraries are now, in relation to their mission.

C. Challenges

Where the Libraries would like to be at the end of the three year period, i.e., what changes would enable the Libraries to better serve their mission.

D. Objectives

An action plan, strategy, and time schedule for implementing the changes.

E. Resource Needs

The resources (budget, space and staff complement) required to implement the plan.

F. Objectives/Mission

The relationship between the Objectives and the Libraries' Mission.

G. Implementation

The steps for carrying out the plan.

H. Predicted Service Capability

The probable ability of the Libraries to optimally serve the needs of the University as these needs evolve; and

I. Shifts in Emphasis

Any changes among Library functions that might be contemplated.

B. THE PRESENT SITUATION

The fiscal year 1975/76 has been used as the base year for assessing the present situation, because it was the last full year of operations before the beginning of the present era of austerity.

Since 1975/76 the staffing for the Libraries has been reduced by 68.5 FTE positions, a decrease of close to 20 percent (19.11%). [Note: An additional eleven positions are scheduled to be dropped for the Geac payback, i.e., staffing reductions to generate the funds for the purchase of the Geac hardware and software.] During the past four years, there has been an increase in university enrollment, and a corresponding increase in use of the Libraries. Through automation, efficient management of resources and a careful pruning of services, the major demands of increased use have been satisfied. The university community is still receiving a reasonable level of access to the library materials and services it requires.

At the same time, these staffing reductions have not been achieved without a marked loss in service. A smaller staff is now spread thinly over the same number of areas. One of the results is that the level of direct service has been reduced, and users generally have to wait longer for most services. Also, some on-going maintenance activities (e.g., identification of "missing" materials; weeding of collections; repair and preservation of materials, etc.) have been severely curtailed. In other words, the Library System is now operating below the staffing level required to maintain current services.

This situation presents a potentially serious problem, because the Library System is engaged in a major program of reorganization and systems implementation to maintain service levels under austerity conditions. (See objectives 5 through 7 - implementations of Geac on-line systems.) The change over to any new system, however efficient that system may ultimately be, imposes temporary but additional workloads for planning, training, reorganization, and cleanup of databases. To provide a reasonable chance for success, staffing levels during implementation should be slightly above, not below, the normal requirement. As a result of the present low level of staffing, there is now a high risk factor attached to each of the planned on-line systems projects. (See Appendix IV.)

Budget reductions since 1975/76 have been made almost entirely in the area of staffing, with the aim of maintaining the acquisitions budget at a reasonable level during an extended period of high inflation and unfavourable currency exchange. Expenditures for library acquisitions were $1,517,396 in 1975/76, and $2,762,103 in 1982/83. However, the cost of serial titles increased throughout the period at a significantly higher rate than the cost of other materials, giving the Libraries a continuing problem of maintaining balance in the mix of new materials purchased. This has been addressed through two serials cancellation projects.

It has been necessary to absorb a steady flow of new materials, and to serve a larger user population, without any possibility of a major building program to provide additional space. This has been done primarily through a careful husbanding of existing space resources. A regular withdrawal program was introduced to dispense with materials no longer required, and thereby conserve existing shelf space. Additional shelving and reader space was attained in The D.B. Weldon Library by moving two processing units to the Somerville building. Additional shelving space for Sciences materials was achieved through the amalgamation of the former Natural Sciences and Health Sciences Libraries. Recently, an expansion of the Music Library was completed.

However, a number of space problems currently exist, or will develop in the near future. To date, it has not been possible to find the increase in reader space needed in the Sciences Library to match the sharp enrollment increase in the Faculty of Science. The Law Library will require additional space for both users and collections by 1985/86. Staffing shortages throughout the Library System and other priorities have forced a temporary suspension of the weeding and withdrawal program. Finally, there is a present and growing need for the constant shifting of materials, as the present shelves become full, to accommodate the inevitably uneven growth rate of various parts of the collections.

C. CHALLENGES

While the Libraries have been highly successful in developing and strengthening the collections, and successful in utilizing new technology, there have been a number of shortcomings and inadequacies in providing access to library collections, in facilitating their use, and in making available seating and work space for library users. The following plan, covering four key areas (space requirements, information technology, collections, and services), is designed to strengthen library service and to rectify some of the major problems and imbalances.

At the end of the three year period, the Libraries would like to provide adequate space for both the users and the collection requirements. This is addressed by Objectives #1, 2, 3, 10, 12.

In order to maintain services at an adequate level in relation to reduced staffing, as well as to operate efficiently and to improve the delivery of services, the Libraries must make effective use of rapidly developing technologies. This means that the existing program for automation of major functions must be successfully implemented. Objectives 4, 5, 6, and 7 address the necessary steps. As noted above, however, there is now a high level of risk associated with each of these projects. (See also Appendix IV.)

The most immediate benefits of information technology lie in improved internal library services: library materials can be obtained faster, and be made available sooner after they have been acquired, accessed more quickly from multiple locations, and they can be checked-out more rapidly. The external implications for local library service, however, are also of major significance. On-line systems offer the means for the effective establishment of a bibliographic communications network among Canadian libraries. This network will be the essential mechanism for effective resource sharing; it will, for example, facilitate accurate and prompt identification and location of library materials in the network, thus providing a basis for more coordinated decisions on collections development among those academic libraries that have cooperative agreements for resource sharing. This development will assist the decision-making process involved in the acquisition of library materials of less importance for research purposes that might better be held in another library location and borrowed when required. With technological developments making resource sharing easier, the interlibrary loan function will take on increased significance.

It is likely that the present communications problems among libraries can be resolved through iNET (Intelligent Network), a Canadian project designed to make standardization of formats and compatible machine interfaces unnecessary.

To date, the Library System has been able to maintain a balanced, cohesive program of collections building. Objective #8 addresses the steps which will be necessary to maintain that balance. Objective #9 introduces a growing concern -- the need to ensure the continuing existence of primary research materials within the collections. As the collections grow in size and importance the need for preservation becomes increasingly apparent. Objective #10 addresses the exact opposite side of the equation -- to keep the collections relevant to current needs, and to conserve existing space, materials (which are obsolete or worn out) must be withdrawn.

Finally, Objectives #10, 11 and 12 address some important maintenance services which have not been given adequate attention because of staffing reductions and other workload priorities.

D. OBJECTIVES

D-1. Space

Objective #1: To provide adequate space for the users and for the day-to-day operation of the Sciences Library p. 38

Objective #2: To provide adequate space for the collections and users of the Law Library by 1985-86 p. 41

Objective #3: To move the Third Processing Department (the Order/ Receiving Department) to Somerville House during the summer of 1985 p. 41

D-2. Information Technology

Objective #4: To complete the conversion of all records in the UWO Library System's master inventory (i.e., shelf lists) to (MAchine-Readable-Cataloguing (MARC) form by 30 April 1985 p. 42

Objective #5: (a) To install the Geac Catalogue Support System by 30 April 1984, and
(b) To install the Geac On-Line Catalogue by 30 October 1984 p. 45

Objective #6: To install the Geac On-Line Acquisitions System by 30 April 1985 p. 46

Objective #7: (a) To incorporate serials holdings control within the Geac On-Line Catalogue Systems by 1 September 1985; and
(b) To incorporate serials check-in control within the Geac On-Line Acquisitions System by 31 December, 1985 p. 47

D-3. Collections

Objective #8: To review and cancel subscriptions to serial titles which no longer support the academic activities of the University or which provide only a relatively low level of support p. 52

Objective #9: To determine what remains to be done to preserve materials in the UWO Library Collections that have permanent research value p. 54

D-4. Services

Objective #10: To reinstate the weeding and withdrawal program on 1 May, 1985 p. 57

Objective #11: To undertake an inventory of The D.B. Weldon Library in the summer of 1985, and to be completed in the summer of 1987 p. 59

Objective #12: To utilize part-time assistants during the summer to help move the library collections p. 59

Objective #13: To undertake a major cleanup of the On-Line Catalogue data base, beginning in October 1984 and ending no later than 30 April, 1986 p. 60

D-4. Schedule

	Objectives	1984-85	1985-86	1986-87	
1.	Sciences Library (Decision required)				
2.	Law Library	Begin	Complete by June 1986		
3.	Move Third Processing Department		Summer 1985		
4.	Records Conversion	Complete Monographs: May 1, 1984	Complete Serials: April 30, 1985		
5.	Install - Catalogue Support System	April 30, 1984			
	On-Line Catalogue	Oct. 30, 1984			
6.	Install - On-Line Acquisitions	April 30, 1985			
7.	Incorporate - Serials holdings in the On-Line Catalogue System		September 1, 1985		
	Serials Check-In in the On-Line Acquisitions System		December 31, 1985		
8.	Review Serial Subscriptions	Weldon Library	Sciences Library	Bus., Ed., Eng., Law, and Music Libraries	
9.	Preserve Materials		Continue to identify items	Microfilming & Restoration (Ongoing)	
10.	Reinstate weeding & withdrawal program		1 May 1985	Ongoing	
11.	Inventory - Weldon Library		Summer 1985	Summer 1986	Summer 1987
12.	Move Library Collections	Summer 1984	Summer 1985	Summer 1986	
13.	Clean up the On-Line Catalogue Data Base	Begin May 1984	Complete by April 1986		

E. RESOURCE NEEDS (BUDGET, SPACE AND STAFFING) TO IMPLEMENT THE OBJECTIVES

Objective 1 - Sciences Library Addition

An addition or alternative use of space for the Sciences Library will be considered by the University Task Force on Space. Capital funding will be required.

Objective 2 - Law Library Addition

An addition to the Law Library was excluded from the current Five Year Capital Plan. It will be considered by the Task Force in their next Five Year Plan.

Objective 3 - Move the Third Processing Department to Somerville House

Funding for this project was included in the current Five Year Capital Plan.

Objective 4 - Records Conversion

No additional resources are required, assuming no additional reductions in library staffing other than the reductions for the Geac payback.

Objective 5 - Install the Catalogue Support System and the On-line Catalogue

Objective 6 - Install On-line Acquisitions

Objective 7 - Incorporate Serials Holdings in the On-line Catalogue System and Serials Check-In in the On-line Acquisitions System

Funding for these subsystems of the Geac Integrated On-line System has been previously approved; however, it is anticipated that during 1984-85 the System will require an additional CPU, additional terminals and associated hardware at an estimated cost of $250,000. (see page 46).

Objective 8 - Review Serials Subscriptions

No additional resources required

Objective 9 - Preserve Materials

The cost of microfilming and special restoration to be done in 1986-87 will be determined after the collections have been surveyed and items identified.

Objective 10 - Reinstate Weeding & Withdrawal Program

Most of the staffing for this project will be available following the completion of the Records Conversion (Objective #4). However, an additional 1-1/2 F.T.E.'s/yr. at a cost of $22,000. will be required to reinstate this ongoing activity.

Objective 11 - Inventory Weldon Library
Objective 12 - Move Library Collections

To successfully undertake and complete these objectives, an additional $24,000/yr will be required for the necessary part-time staff.

Objective 13 - Clean-up Catalogue Data Base

An additional requirement of 5 LA II's and 1 LA IV for two years is needed to carry out this project: additional funding of $92,000. in 1984-85 and $92,000. in 1985-86 will be needed.

In summary, the additional resource needs, excluding Capital Funding for the Sciences and Law Libraries, are as follows:

		1984-85	1985-86	1986-87	Ongoing
Objective	5,6,7	$250,000	$	$	$
"	10		22,000	22,000	22,000
"	11,12		24,000	24,000	
"	13	92,000	92,000		
	Total	$342,000	$138,000	$46,000	$22,000

F. RELATIONSHIP OF THE OBJECTIVES TO THE LIBRARIES' MISSION

1. Sciences Library 2. Law Library 3. Move Processing Department to Somerville House	To provide physical facilities and equipment for the storage, use and security of library collections, and To make available library space for patrons and working space for staff.
4. Conversion of Records 5. Catalogue Support System and On-Line Catalogue 6. Acquisitions Systems 7. Incorporate Serials	To provide access to library collections and to facilitate their use, and To cooperate with other University Libraries in order to provide access to library resources and information located elsewhere.
8. Review Subscriptions 9. Preserve Materials	To provide [and conserve] library collections to support the University's instructional needs and research activities.
10. Reinstate Weeding Program	To provide physical facilities and equipment for the storage, use and security of library collections.
11. Inventory of the Weldon Library 12. Move Collections 13. Clean-up the On-Line Catalogue Data Base	To provide access to library collections and to facilitate their use

G. IMPLEMENTATION OF THE PLAN

The Three Year Plan provides a framework within which the University Library System seeks to fulfill its mission. The ability of the Libraries to implement this plan depends, almost entirely, on the stability of staffing, the availability of space, the resources required to implement the plan, and the good fortune of correct timing.

The thirteen objectives of the plan are all labour-intensive, and they are all in addition to the regular staff functions required to provide day-to-day service to the University community. The relative priority of the planning objectives are:

1st Priority

- Sciences Library
- Records Conversion
- Catalogue Support System
- On-Line Catalogue
- Review of Serials Subscriptions
- Weeding and withdrawal

2nd Priority

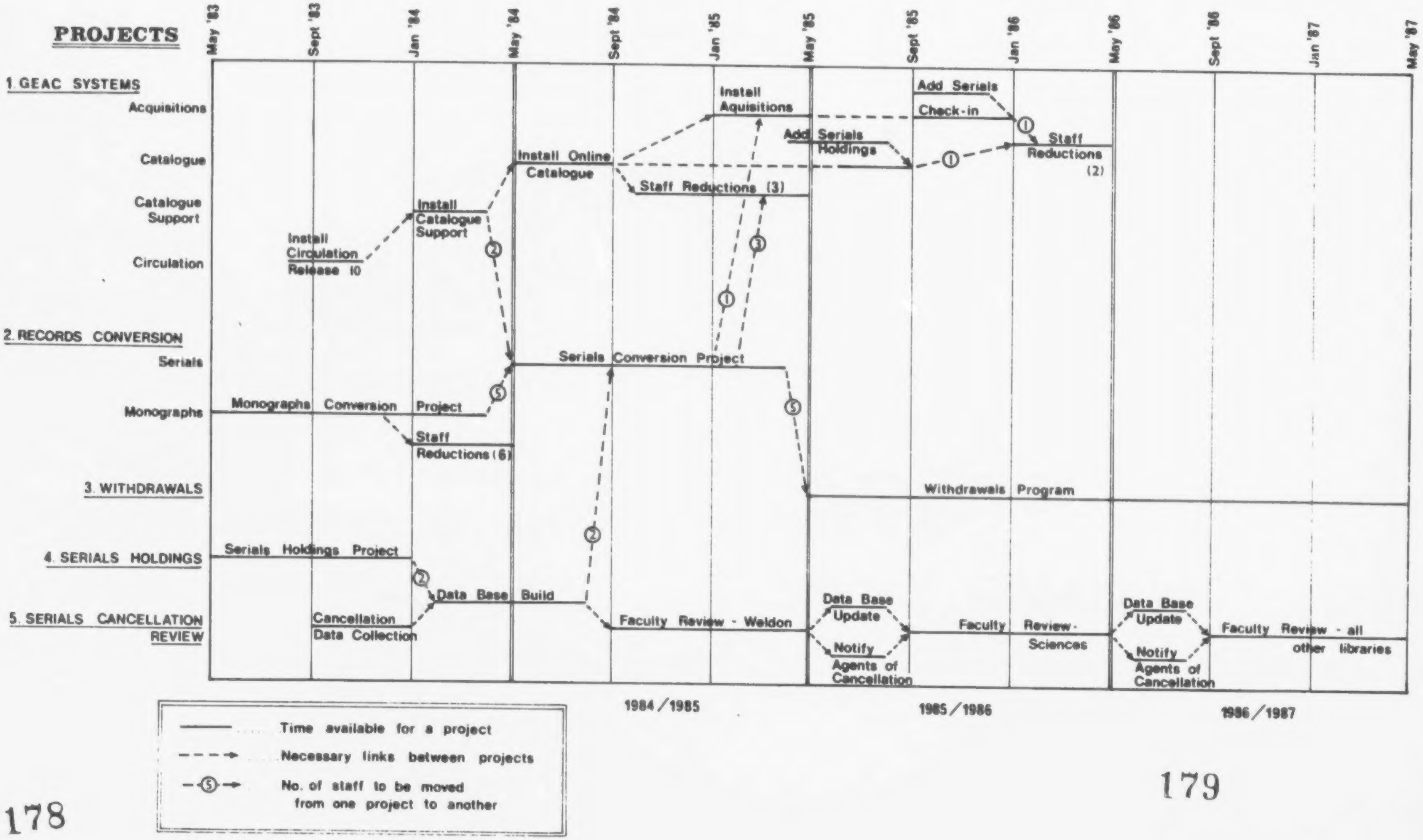
- Law Library
- Preservation
- Clean up the On-Line Catalogue Data Base
- On-Line Acquisitions

3rd Priority

- Processing Department to Somerville House
- Inventory
- Moving collections

It should be clearly recognized that the technology-related objectives as well as the objectives relating to conversion, serials cancellations and withdrawal are high risk ventures. They might not be achieved in the order planned, because of the shifts in staffing that are required. This shifting of staff from one project to another (within a tight time schedule) is shown on the following chart.

TIME CHART : Showing the Interrelationships Among Some of the LIBRARY SYSTEM's Major Projects 1983/84 - 1986/87


PROJECTS
May '83
Sept '83
Jan '84
May '84
Sept '84
Jan '85
May '85
Sept '85
Jan '86
May '86
Sept '86
Jan '87
May '87
1. GEAC SYSTEMS
Acquisitions
Catalogue
Catalogue Support
Circulation
2. RECORDS CONVERSION
Serials
Monographs
3. WITHDRAWALS
4. SERIALS HOLDINGS
5. SERIALS CANCELLATION REVIEW
Install Circulation Release 10
Install Catalogue Support
2
Install Online Catalogue
Install Aquisitions
Staff Reductions (3)
Add Serials Check-in
Add Serials Holdings
1
1
Staff Reductions (2)
1
3
Serials Conversion Project
Monographs Conversion Project
5
Staff Reductions (6)
5
Withdrawals Program
Serials Holdings Project
2
Data Base Build
2
Cancellation Data Collection
Faculty Review - Weldon
Data Base Update
Notify Agents of Cancellation
Faculty Review - Sciences
Data Base Update
Notify Agents of Cancellation
Faculty Review - all other libraries
1984/1985
1985/1986
1986/1987
Time available for a project
Necessary links between projects
5
No. of staff to be moved from one project to another

H. PREDICTED SERVICE CAPABILITY

Will the Libraries continue optimally to serve the needs of the University as these needs evolve?

The Libraries can continue to provide an adequate level of service to the University community during the next four years, provided there are no additional staff reductions other than the planned reductions in Processing relating to the Geac payback.

If additional budget reductions are required, it will be necessary to reduce the Acquisitions budget and the Processing staff accordingly. The Libraries have gone about as far as they can in reducing Public and Administrative Services. Any additional staff reductions in these functional areas would create a serious imbalance in day-to-day operations, and thus significantly deter the provision of library service to the University community.

As the library collections grow, public services staff have more tasks to perform in managing the collections and in providing assistance in their use. The Libraries are complex and becoming more so, because sources of information are not only proliferating but are also becoming more complex. Even skilled users who wander outside their immediate field need a guide or mediator in order to make maximum use of the collections.

Since public services are primarily staffed to provide coverage during the hours the Libraries are open, reductions in public service personnel can be made only by reducing hours of opening or eliminating major functions. All of the present functions in public services are provided in relation to existing demands, as indicated by the 1983 User Preference Survey. Efforts to further reduce public services are likely to lead, therefore, to serious user frustration.

Reductions in acquisitions are not desirable. However, if additional budget reductions are required, a reduction in acquisitions would result in the least overall disruption in the provision of service, assuming a reduction in inflation in book and serial prices and no significant reduction in the exchange value of the Canadian dollar.

Resource Allocation

During the period from 1975-76 to the present, first priority has been given to the maintenance of an adequate acquisitions budget. Expenditures for acquisitions increased from $1,517,396. in 1975/76, to $2,762,103. in 1982/83, representing an 82% increase. Despite this large increase, single transaction acquisitions (mainly consisting of monographic purchases) declined from approximately 50,000 orders in 1976/77 to approximately 30,000 in 1977/78, a decline which The University Library System was able to absorb largely on account of the fact that development of the collections had by this time caught up with the earlier and rapid growth of the University's academic programs. Since 1977/78 the volume of single transaction acquisitions has been maintained at a level ranging from 28,600 to 32,000 orders per annum through the annual increases in the acquisitions budget, two serials cancellation projects (which freed up existing funds for new purchases), the transfer of funds on several occasions (after the budget was set) from salaries to acquisitions, and through changes in composition of single transaction purchases by acquiring fewer items involving large individual expenditures (e.g. research sets on microfilm). In view of the Library System's experience beginning with the 1977/78 fiscal year, 28,000 to 32,000 discretionary items is the relative rate of acquisitions required annually to support the instructional programs and research activities of the University.

Budget reductions since 1975-76 have been made almost entirely in the area of staffing in order to give first priority to the acquisitions budget. The staffing for the Libraries has been reduced by 68.5 positions, a decrease of 19.11 percent. In addition, a total of eleven positions are scheduled to be dropped in 1984-85, 1985-86, and 1986-87 for the Geac payback.

Summary: Since 1975-76 the priorities for resource allocation have been:

1st Priority - Acquisitions
2nd Priority - Staffing.

During the last two years, there has been a stabilization in the cost of books (although serial subscriptions continue to rise), and a more favourable rate of currency exchange has occurred.

In 1984-85 equal emphasis must be given to acquisitions and staffing. Otherwise there will be a serious imbalance resulting in a disruption in essential user services, further deterioration of the maintenance activities required to provide service, and an undermining of the Library System's commitment to implement an integrated, on-line library system. To maintain an appropriate balance between acquisitions and staffing during the three year period from 1985-86 to 1987-88 (and assuming that a 5% reduction may be required during this period) it may be necessary to reduce gradually the number of discretionary orders. This is the most feasible way to maintain a reasonable balance between acquisitions and staffing.

I. SHIFTS IN EMPHASIS

Are any shifts in emphasis taking place among library functions? Are these appropriate? Should any others be contemplated?

Currently there are no major shifts taking place among library functions. During the next three years, however, it is assumed that, as the additional on-line systems are introduced, there will be a subsequent (already scheduled) reduction in the Processing staff.

OFFICE OF MANAGEMENT STUDIES

ASSOCIATION OF RESEARCH LIBRARIES
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036 • (202) 232-8656

SELECTED READINGS ON STRATEGIC PLANNING

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